96-33

DEPARTMENT OF ENERGY AUTHORIZATIONS FOR FISCAL YEAR 1981

HEARING

BEFORE THE

SUBCOMMITTEE ON ENERGY AND THE ENVIRONMENT

OF THE

COMMITTEE ON INTERIOR AND INSULAR AFFAIRS HOUSE OF REPRESENTATIVES

NINETY-SIXTH CONGRESS

SECOND SESSION

ON

H.R. 6627

TO AUTHORIZE APPROPRIATIONS TO THE DEPARTMENT OF ENERGY FOR CIVILIAN PROGRAMS FOR FISCAL YEAR 1981 AND FISCAL YEAR 1982, AND FOR OTHER PURPOSES

HEARING HELD IN WASHINGTON, D.C.
FEBRUARY 25, 1980

Serial No. 96–33

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DEPARTMENT OF ENERGY AUTHORIZATIONS FOR FISCAL YEAR 1981

MONDAY, FEBRUARY 25, 1980

U.S. HOUSE OF REPRESENTATIVES,
SUBCOMMITTEE ON ENERGY AND THE ENVIRONMENT,
COMMITTEE ON INTERIOR AND INSULAR AFFAIRS,
Washington, D.C.

The subcommittee met, pursuant to notice, at 9:45 a.m., in room 1324, Longworth House Office Building, Hon. Morris K. Udall (chairman of the subcommittee) presiding.

The CHAIRMAN. The subcommittee will come to order.

This morning we will begin our review of the Department of Energy's budget request for fiscal year 1981.

The Subcommittee on Energy and the Environment is particularly interested in the Department's program for developing and meeting licensing requirements for commercial high-level waste repositories.

Increasing national low-level waste burial capacity is another urgent national problem. I hope we can come to a decision soon regarding a Federal program for away-from-reactor interim spent fuel storage.

[The bill H.R. 6627 follows:]

96TH CONGRESS
2D SESSION

H.R. 6627

To authorize appropriations to the Department of Energy for civilian programs for fiscal year 1981 and fiscal year 1982, and for other purposes.

IN THE HOUSE OF REPRESENTATIVES

FEBRUARY 26, 1980

Mr. STAGGERS (for himself, Mr. UDALL, and Mr. FUQUA) (by request) introduced the following bill; which was divided and referred as follows: Title I to the Committee on Science and Technology; Titles II and III to the Committee on Interstate and Foreign Commerce; Title IV to the Committee on Interior and Insular Affairs; Title V concurrently to the Committees on Interior and Insular Affairs and Interstate and Foreign Commerce; Title VI concurrently to the Committees on Interstate and Foreign Commerce and Science and Technology; and Titles VII and VIII concurrently to the Committees on Foreign Affairs, Interior and Insular Affairs, Interstate and Foreign Commerce, and Science and Technology

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A BILL

To authorize appropriations to the Department of Energy for civilian programs for fiscal year 1981 and fiscal year 1982, and for other purposes.

Be it enacted by the Senate and House of Representatives of the United States of America in Congress assembled, That this Act may be cited as the "Department of Energy

Authorization Act for Fiscal Years 1981 and 1982—Civilian Applications".

TITLE I—RESEARCH AND DEVELOPMENT

SEC. 101. Funds are hereby authorized to be appropriated for fiscal year 1981 in accordance with section 660 of the Department of Energy Organization Act for operating and capital equipment expenses for the following fossil fuel programs:

(A) Coal, $597,071,000;

(B) Petroleum, $63,758,000; and

(C) Enhanced gas recovery, $30,821,000.

SEC. 102. Funds are hereby authorized to be appropriated for fiscal year 1981 in accordance with section 660 of the Department of Energy Organization Act for fossil energy construction relating to coal, including planning, construction, acquisition, or modification of facilities, including land acquisition, as follows:

(A) Project 81-T-401, renovation of South Wing, Building 3, Bartlesville Energy Technology Center, Oklahoma, $1,200,000;

(B) Project 81-T-402, surplus water containment and waste water treatment facility, Pittsburgh Energy Technology Center, Pennsylvania, $1,300,000;

(C) Project 81-T-404, general plant projects, six locations, $6,000,000;

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(D) Project 80–FE–3, program support facility, Pittsburgh Energy Technology Center, Pennsylvania, an additional sum of $7,800,000 for a total project authorization of $9,500,000;

(E) Project 80–FE–10, atmospheric fluidized bed combustion component test and integration unit, Morgantown, West Virginia, an additional sum of $9,935,000, for a total project authorization of $49,795,000;

(F) Project 80–FE–11, pressurized fluidized bed combined cycle pilot plant, Woodridge, New Jersey, an additional sum of $9,200,000 for a total project authorization of $39,000,000;

(G) Project 79–1–R, SRC–II (Liquids) Demonstration Plant, West Virginia, an additional sum of $210,000,000 for a total project authorization of $300,000,000;

(H) Project 78–2–D, SRC–I (Solids) Demonstration Plant, Kentucky, an additional sum of $195,000,000, for a total project authorization of $275,000,000; and

(I) Project 76–1–B, high Btu synthetic pipeline gas demonstration plant, Noble County, Ohio and Perry County, Illinois, an additional sum of

$193,000,000 for a total project authorization of $275,000,000.

SEC. 103. Funds are hereby authorized to be appropriated for fiscal year 1981 in accordance with section 660 of the Department of Energy Organization Act for operating expenses for the following supply research and development programs:

(A) Solar applications, $130,286,000;

(B) Solar technology, $414,500,000;

(C) Geothermal, $131,179,000;

(D) Nuclear fission, $618,847,000;

(E) Magnetic fusion, $286,117,000;

(F) Electric energy systems, $38,423,000;

(G) Energy storage systems, $70,100,000;

(H) Hydropower, $8,211,000;

(I) Environment, $240,954,000; and

(J) Supporting research, $274,085,000.

SEC. 104. Funds are hereby authorized to be appropriated for fiscal year 1981 in accordance with section 660 of the Department of Energy Organization Act for supply research and development plant and capital equipment, including planning, construction, acquisition, or modification of facilities, including land acquisition; and acquisition and fabrication of capital equipment not related to construction, as follows:

(A) Solar applications capital equipment not related to construction, $2,500,000;

(B) Solar Technology:

(1) Project 81-T-305, ethanol from biomass production/conversion system, location to be determined, $2,500,000;

(2) Project 81-T-306, solar industrial cogeneration project, location to be determined, $1,900,000;

(3) Project 80-B-1, biomass thermochemical gasification experimental facility, site to be determined, an additional sum of $2,000,000, for a total project authorization of $4,000,000;

(4) Project 80-ES-2, Shenandoah solar total energy project, Shenandoah, Georgia, an additional sum of $5,800,000, for a total project authorization of $16,400,000;

(5) Project 80-ES-19, small community solar thermal power experiment, location to be determined, an additional sum of $3,750,000, for a total project authorization of $7,545,000;

(6) Project 79-1-Q, Solar Energy Research Institute facility, Golden, Colorado, an additional sum of $10,000,000, for a total project authorization of $19,900,000;

(7) Project 76-2-B, ten megawatt central receiver solar thermal powerplant, Barstow, California, an additional sum of $10,000,000, for a total project authorization of $118,000,000; and

(8) Solar technology capital equipment not related to construction, $14,050,000.

(C) Geothermal:

(1) Project 80-G-1, geothermal demonstration powerplant project, Valles Caldera, New Mexico, an additional sum of $10,911,000, for a total project authorization of $50,340,000; and

(2) Geothermal capital equipment not related to construction, $1,310,000.

(D) Nuclear Fission:

(1) Project 81-T-301, general plant projects, $2,000,000;

(2) Project 81-T-302, salt test facility, site undetermined, $6,800,000;

(3) Project 81-T-310, general plant projects, $11,500,000;

(4) Project 80-ES-12, near surface test facility, phase II (nuclear waste), Richland, Washington, an additional sum of $3,576,000, for a total project authorization of $11,850,000;

(5) Project 79–1–c, security and safeguards improvements, Richland, Washington, an additional sum of $3,000,000, for a total project authorization of $12,000,000;

(6) Project 78–6–F, fuels and materials examination facility, Richland, Washington, an additional sum of $52,000,000, for a total project authorization of $135,200,000; and

(7) Nuclear fission capital equipment not related to construction, $30,410,000.

(E) Magnetic Fusion:

(1) Project 81–T–313, general plant projects, $5,400,000;

(2) Project 80–MF–3, Elmo bumpy torus proof of principal, location to be determined, an additional sum of $34,900,000, for a total project authorization of $44,000,000;

(3) Project 80–MF–4, large coil test facility, Oak Ridge, Tennessee, an additional sum of $6,690,000, for a total project authorization of $16,950,000;

(4) Project 78–3–B, fusion materials irradiation test facility, Richland, Washington, an additional sum of $79,850,000, for a total project authorization of $104,250,000;

(5) Project 76-5-A, Tokamak fusion test reactor, Princeton Plasma Physics Laboratory, Plainsboro, New Jersey, an additional sum of $45,000,000, for a total project authorization of $283,600,000; and

(6) Magnetic fusion capital equipment not related to construction, $38,100,000.

(F) Electric energy systems capital equipment not related to construction, $1,500,000.

(G) Energy storage systems capital equipment not related to construction, $1,700,000.

(H) Environment:

(1) Project 81-E-305, general plant projects, $3,000,000;

(2) Project 81-E-306, modifications and additions to biomedical and environmental research facilities, various locations, $3,400,000; and

(3) Environment capital equipment not related to construction, $13,740,000.

(I) Supporting Research:

(1) Project 81-E-301, general plant projects, $300,000;

(2) Project 81-E-304, accelerator improvements and modifications, Oak Ridge National Laboratory, Oak Ridge, Tennessee, $200,000;

(3) Project 81-E-308, energy systems research laboratory (ESRL), Oak Ridge National Laboratory, Oak Ridge, Tennessee, $2,000,000;

(4) Project 81-E-309, rehabilitation of general purpose physical plant, Argonne, Illinois, $15,100,000;

(5) Project 81-E-310, transmission and distribution systems upgrading, Richland, Washington, $12,000,000;

(6) Project 81-E-311, energy science and technology building expansion, Brookhaven National Laboratory, New York, $12,000,000;

(7) Project 81-E-312, environment and energy technology facility, Richland, Washington, $18,000,000;

(8) Project 81-E-313, central energy conservation facility, Brookhaven National Laboratory, New York, $9,100,000;

(9) Project 81-E-314, energy utilization improvements, Brookhaven National Laboratory, New York, $2,000,000;

(10) Project 81-E-315, centralized cogeneration with chilled and hot water distribution, Argonne National Laboratory, Illinois, $7,400,000;

(11) Project 81-E-316, boiler numbered 3 replacement, Brookhaven National Laboratory, New York, $3,000,000;

(12) Project 81-E-317, roof replacement, Idaho National Engineering Laboratory, Idaho, $5,300,000;

(13) Project 81-E-318, upgrade primary substation, Oak Ridge, National Laboratory, Oak Ridge, Tennessee, $3,500,000;

(14) Project 81-E-319, install coal-fired atmospheric fluidized-bed boiler, Argonne National Laboratory, Illinois, $7,100,000;

(15) Project 81-E-320, central supply facility, Argonne National Laboratory, Illinois, $8,500,000;

(16) Project 81-E-321, site utilities project, Ernest Orlando Lawrence Livermore National Laboratory, California, $7,900,000;

(17) Project 81-E-322, Scoville substation distribution system upgrade, Idaho National Engineering Laboratory, Idaho, $1,000,000;

(18) Project 81-E-323, fire safety improvements, Argonne National Laboratory, Illinois, and Idaho National Engineering Laboratory, Idaho, $4,100,000;

(19) Project 81-E-324, fire safety and protection improvements, Idaho National Engineering Laboratory, Idaho, $3,400,000;

(20) Project 80-ES-10, chemical and materials sciences laboratory, Lawrence Berkeley Laboratory, California, an additional sum of $6,300,000, for a total project authorization of $12,600,000; and

(21) Support research capital equipment not related to construction, $16,500,000.

SEC. 105. Funds are hereby authorized to be appropriated for fiscal year 1981 in accordance with section 660 of the Department of Energy Organization Act for operating expenses and capital equipment not related to construction for the following conservation research and development programs:

(A) Buildings and community systems, $64,225,000;

(B) Industrial energy conservation, $54,400,000;

(C) Transportation, $64,200,000; and

(D) Multi-Sector, $15,100,000.

SEC. 106. Funds are hereby authorized to be appropriated for fiscal year 1981 in accordance with section 660 of the Department of Energy Organization Act for operating

expenses for the following general science and research programs:

(A) Life sciences research and nuclear medicine applications, $45,650,000;

(B) High energy physics, $242,245,000; and

(C) Nuclear physics, $88,800,000.

SEC. 107. Funds are hereby authorized to be appropriated for fiscal year 1981 in accordance with section 660 of the Department of Energy Organization Act for general science and research plant and capital equipment, including planning, construction, acquisition, or modification of facilities, including land acquisition; and acquisition and fabrication of capital equipment not related to construction, as follows:

(A) Life sciences research and nuclear medicine applications capital equipment not related to construction, $2,900,000;

(B) High Energy Physics:

(1) Project 81-E-218, Tevatron, Phase I, Fermi National Accelerator Laboratory, Illinois, $39,500,000;

(2) Project 81-E-219, accelerator improvements and modifications, various locations, $6,000,000;

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(3) Project 81–E–220, general plant projects, $5,000,000;

(4) Project 79–9–B, energy saver, Fermi National Accelerator Laboratory, Batavia, Illinois, an additional sum of $19,600,000, for a total project authorization of $46,600,000;

(5) Project 78–10–B, intersecting storage accelerator (ISABELLE) 400x400 GeV, Brookhaven National Laboratory, Upton, New York, an additional sum of $196,500,000, for a total project authorization of $275,000,000; and

(6) High energy physics capital equipment not related to construction, $39,000,000.

(C) Nuclear Physics:

(1) Project 81–E–221, accelerator improvements and modifications, various locations, $1,600,000;

(2) Project 81–E–222, general plant projects, $2,800,000;

(3) Project 81–E–223, Argonne tandem-linac accelerator system, Argonne National Laboratory, Illinois, $6,900,000;

(4) Project 80–GS–5, National Superconducting Cyclotron Laboratory, Michigan State University, East Lansing, Michigan, an additional

sum of $24,000,000, for a total project authorization of $30,000,000; and

(5) Nuclear physics capital equipment not related to construction, $9,400,000.

SEC. 108. Funds are hereby authorized to be appropriated for fiscal year 1981 in accordance with section 660 of the Department of Energy Organization Act for operating expenses for the uranium enrichment program, as follows:

(A) Uranium enrichment activities—process development operating expenses, $78,500,000; and

(B) Advanced isotope separation technology, $67,299,000.

SEC. 109. Funds are hereby authorized to be appropriated for fiscal year 1981 in accordance with section 660 of the Department of Energy Organization Act for the uranium enrichment plant and capital equipment, including planning, construction, acquisition, or modification of facilities, including land acquisition, and acquisition and fabrication of capital equipment not related to construction as follows:

(A) Project 81-T-501, isotope research and development laboratory, New Mexico, $16,000,000;

(B) Project 81-T-502, advanced isotope separation laboratory, Ernest Orlando Lawrence Livermore National Laboratory, California, $29,700,000;

(C) Project 81-T-504, general plant projects, $2,970,000;

(D) Project 76-8-G, enriched uranium production facilities, Portsmouth, Ohio, an additional sum of $286,325,000, for a total project authorization of $1,121,630,000; and

(E) Uranium enrichment capital equipment not related to construction, $12,300,000.

SEC. 110. Funds are hereby authorized to be appropriated for fiscal year 1981 in accordance with section 660 of the Department of Energy Organization Act for expenses of the geothermal resources development fund as follows:

(A) Geothermal resources development fund, $1,284,000.

TITLE II—COMMERCIALIZATION AND RELATED ACTIVITIES

SEC. 201. Funds are hereby authorized to be appropriated for fiscal year 1981 in accordance with section 660 of the Department of Energy Organization Act for expenses for the following commercialization and related activities programs:

(A) Renewable Resources—Expenses:

(1) Solar planning, demonstration, and distribution, $10,040,000;

(2) Solar information systems, $1,400,000;

(3) Hydrothermal commercialization, $10,000,000;

(4) Hydropower, $10,789,000; and

(5) Multiresource, $1,036,000.

(B) Conservation Activities—Expenses:

(1) Buildings and community systems, $11,575,000;

(2) Transportation, $6,700,000;

(3) State and local, $416,959,000: *Provided*, That not more than 25 per centum of funds appropriated for the schools and hospitals grant program in fiscal year 1981 may be used for purposes of technical assistance;

(4) Energy information campaign, $50,000,000; and

(5) Energy impact assistance, $150,000,000.

TITLE III—REGULATORY AND RELATED FUNCTIONS

SEC. 301. Funds are hereby authorized to be appropriated for fiscal year 1981 in accordance with section 660 of the Department of Energy Organization Act for economic regulation as follows:

(A) to the Economic Regulatory Administration for expenses, $153,621,000; and

(B) to the Office of Hearings and Appeals for expenses, $3,850,000.

SEC. 302. Funds are hereby authorized to be appropriated for fiscal year 1981 in accordance with section 660 of the Department of Energy Organization Act for expenses for the Federal Energy Regulatory Commission as follows:

(A) Federal Energy Regulatory Commission expenses, $76,374,000.

SEC. 303. Funds are hereby authorized to be appropriated for fiscal year 1981 in accordance with section 660 of the Department of Energy Organization Act for expenses for the following energy information program:

(A) Energy information expenses, $107,420,000.

SEC. 304. Funds are hereby authorized to be appropriated for fiscal year 1981 in accordance with section 660 of the Department of Energy Organization Act for expenses for the following strategic petroleum reserves program:

(A) Strategic petroleum reserve expenses, $103,978,000.

TITLE IV—POWER MARKETING AND FEDERAL LEASING

SEC. 401. Funds are hereby authorized to be appropriated for fiscal year 1981 in accordance with section 660 of the Department of Energy Organization Act for expenses for the following power marketing programs:

(A) Alaska Power Administration, including expenses for engineering and economic investigation to promote the development and utilization of the water, power, and related resources of Alaska, $3,069,000;

(B) Southeastern Power Administration, including continuing fund, $1,552,000;

(C) Southwestern Power Administration, including continuing fund, $28,208,000;

(D) Western Area Power Administration, for construction, rehabilitation, operation, and maintenance of electric power transmission facilities, and power marketing activities, $138,502,000 of which $124,200,000 shall be derived from the Department of Interior reclamation fund;

(E) Western Area Power Administration, for the emergency fund established pursuant to the Act of June 26, 1948 (43 U.S.C. 502), to assure continuous operations during unusual or emergency conditions, $200,000, all of which shall be derived from the reclamation fund; and

(F) Western Area Power Administration, for continued work on the transmission system of the Upper Colorado River storage project, authorized by section 1(1) of the Act of April 11, 1956 (Public Law 84-485) and legislation supplementary thereto, including the

Act of August 10, 1972 (Public Law 92-370), $3,548,000.

SEC. 402. Funds are hereby authorized to be appropriated for fiscal year 1981 in accordance with section 660 of the Department of Energy Organization Act for expenses for the following Federal leasing and fuel data gathering and analysis programs:

(A) Federal leasing expenses, $3,300,000; and

(B) Fuel data gathering and analysis expenses, $8,803,000.

TITLE V—NUCLEAR ASSESSMENT, SPENT NUCLEAR FUEL STORAGE AND COMMERCIAL WASTE REMEDIAL ACTION

SEC. 501. Funds are hereby authorized to be appropriated for fiscal year 1981 in accordance with section 660 of the Department of Energy Organization Act for operating expenses for the following uranium resource assessment program:

(A) Uranium resource assessment operating expenses, $34,455,000.

SEC. 502. Funds are hereby authorized to be appropriated for fiscal year 1981 in accordance with section 660 of the Department of Energy Organization Act for uranium resource assessment plant and capital equipment, including planning, construction, acquisition, or modification of facili-

ties, including land acquisition; and acquisition and fabrication of capital equipment not related to construction, as follows:

(A) Project 81-R-501, general plant projects, $800,000; and

(B) Uranium resource assessment—capital equipment not related to construction, $500,000.

SEC. 503. Funds are hereby authorized to be appropriated for fiscal year 1981 in accordance with section 660 of the Department of Energy Organization Act for operating expenses for the spent nuclear fuel storage and remedial action programs as follows:

(A) Spent nuclear fuel storage expenses, $19,513,000; and

(B) Commercial nuclear waste remedial action expenses, $52,000,000.

SEC. 504. Funds are hereby authorized to be appropriated for fiscal year 1981 in accordance with section 660 of the Department of Energy Organization Act for spent nuclear fuel storage and remedial action programs capital equipment not related to construction, $2,550,000.

TITLE VI—OTHER FOSSIL ENERGY, SOLAR ENERGY, AND CONSERVATION ACTIVITIES

SEC. 601. Funds are hereby authorized to be appropriated for fiscal year 1981 in accordance with section 660 of

the Department of Energy Organization Act for expenses for the other fossil energy, solar energy, and conservation activities programs as follows:

(A) Fossil energy—Expenses:

(1) Coal, $6,191,000;

(2) Oil and gas development, $8,345,000; and

(3) Executive direction, $551,000.

(B) Solar energy—Expenses:

(1) Market development and training, $39,500,000; and

(2) Solar international applications, $4,000,000.

(C) Conservation activities—Expenses:

(1) Buildings and community systems, $16,800,000;

(2) Industrial energy conservation, $4,500,000;

(3) Energy Management Partnership Act, $151,625,000; and

(4) Multisector, $14,100,000.

TITLE VII—OTHER DEPARTMENTAL ACTIVITIES

SEC. 701. Funds are hereby authorized to be appropriated for fiscal year 1981 in accordance with section 660 of the Department of Energy Organization Act for operating

expenses for the following uranium enrichment activities programs:

(A) Gaseous diffusion operations and support, $825,926,000;

(B) Gas centrifuge operations and support, $800,000; and

(C) Program direction, $3,060,000.

SEC. 702. Funds are hereby authorized to be appropriated for fiscal year 1981 in accordance with section 660 of the Department of Energy Organization Act for uranium enrichment activities plant and capital equipment, including planning, construction, acquisition, or modification of facilities, including land acquisition; and acquisition and fabrication of capital equipment not related to construction as follows:

(A) Uranium enrichment activities—Plant and capital equipment:

(1) Project 81-R-501, general plant projects, $17,500,000;

(2) Project 81-R-502, UF-6 cylinders and storage yards, gaseous diffusion plants, $8,000,000;

(3) Project 81-R-503, utilities upgrading, gaseous diffusion plants, $27,000,000;

(4) Project 81–R–504, supervisory control and data acquisition systems, Paducah, Kentucky, and Portsmouth, Ohio, gaseous diffusion plants, $13,000,000;

(5) Project 81–R–505, instrumentation for purge cascades and withdrawal areas, gaseous diffusion plants, $6,000,000;

(6) Project 81–R–506, environmental protection and safety modifications, phase I, gaseous diffusion plants, $55,000,000;

(7) Project 80–UE–1, control of gaseous diffusion effluents, gaseous diffusion plants, Oak Ridge, Tennessee, and Paducah, Kentucky, an additional sum of $4,700,000, for a total project authorization of $7,000,000;

(8) Project 80–UE–2, control of water pollution, gaseous diffusion plants, an additional sum of $9,500,000, for a total project authorization of $17,000,000;

(9) Project 80–UE–3, plant facilities security improvements, gaseous diffusion plants, an additional sum of $12,500,000, for a total project authorization of $17,000,000;

(10) Project 80–UE–4, power recovery demonstration cells, gaseous diffusion plants, an addi-

tional sum of $7,000,000, for a total project authorization of $10,500,000;

(11) Project 80-UE-5, motor and switchgear upgrading, gaseous diffusion plants, an additional sum of $20,600,000, for a total project authorization of $28,500,000; and

(12) Uranium enrichment activities capital equipment not related to construction, $24,000,000.

SEC. 703. (a) Funds are hereby authorized to be appropriated for fiscal year 1981 in accordance with section 660 of the Department of Energy Organization Act for operating expenses for departmental administrative activities programs as follows:

(A) Policy analysis and systems studies, $19,600,000;

(B) International affairs, $5,100,000;

(C) Management and support, $287,665,000;

(D) Intergovernmental and institutional relations, $36,743,000;

(E) In-house energy management, $3,900,000;

(F) Security investigations, $17,012,000; and

(G) Other supporting activities, cost of work for others, and changes in inventories, $55,803,000.

(b) Funds are hereby authorized to be appropriated for fiscal year 1981 in accordance with section 660 of the Department of Energy Organization Act for departmental administrative activities plant and capital equipment, including planning, construction, acquisition, or modification of facilities, including land acquisition; and acquisition and fabrication of capital equipment not related to construction, as follows:

(A) Project 81-A-601, modifications for energy management, various locations, $28,200,000;

(B) Project 81-C-601, plant engineering and design, $9,000,000;

(C) Project 81-A-602, energy monitoring and control system, Y-12 plant, Oak Ridge, Tennessee, $5,000,000;

(D) Project 81-A-603, energy monitoring and control system, Oak Ridge National Laboratory, Tennessee, $4,000,000;

(E) Project 81-A-604, HVAC heat recovery and night setback, Richland, Washington, $3,000,000;

(F) Project 81-A-605, automated energy management system, Argonne National Laboratory, Illinois, $3,800,000;

(G) Project 80-DA-6, alternate energy source, Pantex plant, Texas, an additional sum of

$43,300,000, for a total project authorization of $46,600,000; and

(H) Departmental administration capital equipment not related to construction, $5,165,000.

TITLE VIII—AUTHORIZATION OF APPROPRIATIONS FOR FISCAL YEAR 1982

SEC. 801. There is authorized to be appropriated to the Department of Energy to be available no earlier than October 1, 1981, such sums as may be necessary for fiscal year 1982 for programs set forth in this Act.

The CHAIRMAN. Assistant Secretary Ruth Davis will brief us this morning on the national uranium enrichment program and the status of our uranium resources assessment.

Dr. Sheldon Meyers, Deputy Assistant Secretary for Nuclear Waste Management, will begin the testimony with a discussion of the commercial waste budget.

Dr. Meyers, we will be happy to hear from you.

[The prepared statement of Hon. Sheldon Meyers may be found in the appendix.]

STATEMENT OF HON. SHELDON MEYERS, DEPUTY ASSISTANT SECRETARY FOR NUCLEAR WASTE MANAGEMENT, U.S. DEPARTMENT OF ENERGY

Dr. MEYERS. I would like to summarize the remarks I have and cover the highlights, if that is OK with the chairman.

The CHAIRMAN. Yes; we will have your full statement for the record.

Dr. MEYERS. Mr. Chairman and members of the subcommittee, I am pleased to appear before you to discuss the Department of Energy's fiscal year 1981 budget request for the remedial action program and spent nuclear fuel program.

My discussion today will not include comments on H.R. 6390, but I will be happy to participate in a discussion of that bill at a later date to be scheduled by this committee.

Before I outline the elements of the subject programs, I would like to review briefly the salient points of the President's policy on nuclear waste management. As you know, this policy is the culmination of the efforts of the Interagency Review Group on radioactive waste management (IRG).

Its primary objective is to isolate existing and future radioactive waste from military and civilian activities from the biosphere so as to pose no significant threat to public health and safety. The responsibility for resolving military and civilian waste management problems shall not be deferred to future generations.

The technical program must meet all relevant radiological protection criteria as well as all other applicable regulatory requirements. This effort must proceed regardless of future developments within the nuclear industry, its future size, and resolution of specific fuel cycle and reactor design isssues.

The specific steps outlined before are each aimed at accomplishing this overall objective.

The key elements of this policy are as follows:

The establishment of a State planning council will provide for a framework, along with other measures, for State involvement in the waste management planning process.

The basis of the relationship between States and the Federal Government in the siting of high-level waste repositories will be

the principle of consultation and concurrence. DOE will provide financial and technical assistance to State and local governments to facilitate their full participation.

I might add yesterday the chairman of the council, Governor Riley, had the initial organizing meeting downtown as part of the winter meeting of the Governors' Association here.

The CHAIRMAN. Which Governor?

Dr. MEYERS. Governor Riley from South Carolina.

DOE will locate and characterize a number of candidate sites in a variety of geologic media for mined repositories capable of accepting both waste from reprocessing and unreprocessed commercial spent fuel. After full environmental review under NEPA, one or more will be selected from a set of four to five sites as a licensed full-scale repository.

Consistent with this policy, the President is recommending that the waste isolation pilot plant (WIPP) project be canceled. The site will be considered along with others for possible use as a licensed repository for both defense wastes and commercial high-level wastes.

Interim storage of defense waste will continue to be closely controlled by the Federal Government while plans for ultimate disposal in a permanent repository are developed.

The safe interim storage of commercial spent fuel from nuclear power reactors will continue to be the responsibility of the utilities operating these plants until a permanent geologic repository capability exists.

However, the administration will continue to press for legislation to build or acquire limited spent fuel storage capacity at one or more away-from-reactor (AFR) facilities for those utilities unable to expand their storage capabilities and for limited amounts of foreign spent fuel when the objectives of the U.S. nonproliferation policy would be furthered.

DOE will work closely with States, other Government agencies, industry, other organizations, and the public to establish regional disposal sites for commercial low-level waste.

Regulatory reforms in several areas are called for. The Nuclear Regulatory Commission, the Environmental Protection Agency, and the Department of Transportation are directed to take specific actions that will improve both the efficiency of their regulatory activities and their relationships with other Federal agencies and State and local governments.

Finally, the policy statement calls for the preparation of a national plan for nuclear waste management, a draft of which will be published for congressional and public review later this year.

Mr. Chairman, I will now direct my comments to the discussion of the subject programs, and I would like to deviate a bit from the

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prepared testimony, which does not have in it a discussion of the waste isolation program.

The major portion of the commercial nuclear waste program is related to geologic repository development.

The budget request for this program for fiscal year 1981 is $245 million in budget authority, compared to $185 million in fiscal year 1980.

The Department of Energy has the responsibility for accepting high-level radioactive waste from civilian uses of nuclear power and providing for its safe management leading to final disposal. This final disposal must provide isolation of these wastes from the human environment for as long as they remain hazardous.

The commercial nuclear waste program objective is, therefore, to provide facilities for terminal isolation and to develop the technology necessary to provide for the long-term management of radioactive wastes produced in the civilian sector primarily from the production of electricity.

The administration policy with regard to nuclear waste will continue to be based on the protection of public health and safety now and in the future. The program that I will describe today incorporates recommendations made concerning the content of the technology program in the final report issued by the Interagency Review Group on Waste Management, and decisions made by the President on key issues raised by the IRG.

As you know, the IRG has recommended that disposal facilities for radioactive waste should be in deep geologic formations if suitable sites can be found. A draft generic environmental impact statement was issued in 1979 which evaluates and compares the environmental impacts of 10 alternative disposal techniques.

The evaluation supports a continued emphasis on deep geologic disposal. As a potential backup, subseabed disposal investigations will be funded at a level sufficient to provide a technical and environmental feasibility report by the end of 1983.

Deep geologic disposal, then, is being pursued as the interim strategic planning basis. Under the terminal isolation program the necessary research and development to identify sites for repositories and to develop technology necessary for the design, licensing, and operation of a geologic repository will be conducted. The repository will be designed to accept commercial spent fuel, solidified high waste, including defense waste and transuranic wastes.

The site characterization effort will include studies of salt formations including salt domes and bedded salt. The interior gulf coast domes in Mississippi, Louisiana, and Texas, are of interest, as are portions of the Permian Texas, Permian Utah, and Paradox Michigan, Ohio, and New York Salina bedded salt basins.

An expansion of this activity into several new States to explore potential sites in nonsalt geologies is now underway and this activity will increase in fiscal year 1981. Program strategy is to proceed with a three-stage process of regional, area, and site specific investigations; each stage narrows the focus and increases the depth of information about each location to the point where the specific sites can be chosen or rejected.

We are also continuing our evaluation of the potential of deep basalt flows below the Hanford reservation in the State of Wash-

ington and the suitability of the Nevada test site in southern Nevada which has been used in the past for testing of nuclear weapons. In fiscal year 1981 geohydrologic investigation of candidate areas at both sites will be conducted.

The program calls for identification of several candidate sites in salt domes and basalt during fiscal year 1980 with final recommendations in 1981. Candidate sites in other salt and nonsalt formations could be identified 3 or 4 years later.

In the area of technology development, work continues in both broad, long-term generic, and media-specific areas. In fiscal year 1981, these activities include the evalution of alternative engineered barrier concepts, laboratory and field testing of borehole plugging concepts, spent fuel packaging studies at the Engine-Maintenance Assembly/Disassembly Facility at NTS, and radionuclide transport studies and risk assessment modeling in various media.

In situ geologic media tests will continue in fiscal year 1981 to provide valuable data for respository development and design. In situ thermal tests using electrical heaters will continue in salt at Avery Island, La., in granite at Stripa, Sweden, and in basalt at the Near Surface Test Facility at Hanford.

Construction will be completed in fiscal year 1981 at NSTF for a demonstration test involving encapsulated spent fuel and high-level waste. Operation of the Climax Spent Fuel Test Facility to determine the behavior of granite with spent fuel will continue in fiscal year 1981.

Also, preparation for radioactive in situ tests at a salt test facility will be in progress. We want to emphasize that none of the locations for these tests involving radioactive material are considered as a permanent disposal location.

Efforts will also continue in fiscal year 1981 in support of facility design and development. Work will emphasize design optimization studies for a repository in dome salt and conceptual design studies on alternative geologic media, such as basalt.

I would like to now discuss the remedial action program which is part of the commercial nuclear waste program. This is a newly assigned activity in the commercial nuclear waste program. It involves the integration of four programs previously conducted under the Assistant Secretary for Environment.

The budget request for this program for fiscal year 1981 is $54 million in budget authority, compared to $35 million in fiscal year 1980. It should be noted that this includes $5 million for a proposed R. & D. demonstration of solidification of West Valley wastes.

Remedial actions include: Decontaminating formerly utilized sites of the Manhattan engineering district and AEC; implementing of remedial actions at the 25 designated mill tailings locations that were authorized by Congress under Public Law 95–604, the Uranium Mill Tailings Radiation Control Act of 1978; continuing remedial actions to remove tailings from about 800 residences, businesses, and public buildings at Grand Junction, Colo.; and decontamination and decommissioning programs for DOE-owned surplus research, test, and development facilities that were a part of the nuclear development programs of the Department and its predecessor agencies.

This later element also includes the development and documentation of decontamination and decommissioning technology for transfer to the commercial nuclear industry.

That completes the prepared remarks, Mr. Chairman.

We are delighted to answer any questions you might have.

The CHAIRMAN. What Congress is looking for and what the American people are looking for is not the waste problem solved tomorrow morning, although we would all like that to be done, but some kind of a timetable, some kind of a program that will insure people, insure the Congress that we are on the road to help some way, that *x* years or months from now we will have this kind of a program in place.

To my mind comes the experience we had on this committee with the Alaska pipeline. Instead of fooling around with the reviews and approvals, we set up a decision framework which involved a very complex set of circumstances including negotiating arrangements.

We said that at the end of 18 months or 2 years there will be a decision, and there was a decision. We met that deadline.

Do you have this kind of a concept, that you have a program on track, decision points set out, a mechanism that will make certain some time fairly soon we have the name and addresses of the places where we are going to store this stuff?

Dr. MEYERS. There is a distinct difference between the Alaska pipeline and disposal of high level nuclear waste, as you know.

We do have plans and, as I have mentioned earlier, the President asked for a comprehensive plan that would include the activities of the other involved Federal agencies, such as EPA and the Department of Transporation.

We can indeed put together such a plan. Whether or not we will have the mechanism or institutional arrangements that will allow us to proceed on that plan remains to be seen.

As you know, there are many requirements for environmental reviews along the way. We are talking about a situation that is probably unique in recorded history of one generation trying to provide a safe and environmentally sound isolation system for hazardous material that would go off into the future that is different from the past.

As you may recall in the Alaska pipeline situation, Congress did finally pass, I think it was an amendment to a bill that had to do with expanding the right-of-way of the pipeline, and essentially said all of the environmental reviews are complete as of now, so if we see in the future that the institutional constraints are what is bogging it down as opposed to technical problems, then it may be necessary for the Congress to act again.

The CHAIRMAN. It has become a cliche that waste disposal is technically feasible, and the problem is political and I guess that is very obvious and very right, but I would think the President's job is to find ways to make decisions and get the political process underway and I would hope maybe we can work together and find some kind of decision framework, because we have the waste.

It is not a question of should we have the waste.

I have observed over the years this gets more and more complicated. It is like a barrage. I noticed on page 5, you mention the

Duke Power Co. which for 2 years has been trying to get approval to move fuel between two of its reactors. Here, for one company, because of fear and concern and because of the lack of management decision, the time goes on and on and we cannot solve the problem of moving things between two points.

Dr. MEYERS. That is a good example, and again that obviously is not a role that the Department of Energy has to play, but if the institutional framework is such that what we consider to be fairly innocuous gets bogged down, we will look at it in the future, when we are talking about putting in place a geologic repository, and evaluate the roadblocks then.

The President did establish a State planning council and one of the purposes is to look into those institutional things that may be a roadblock in the future and see if in the national interest the States can provide a framework for the job to be gotten on with.

The CHAIRMAN. On page 4 down at the bottom, you say the administration believes that a limited amount of Government AFR storage should be provided for those utilities that are unable to find other storage.

If I am a utility, what incentive do I have to do other than sit back and say we cannot find storage, Uncle Sam, we need it from you. To what extent are there incentives built in your proposal to insure that most utilities are not going to take advantage of the fairly big loophole?

You say utilities are unable to find storage. Given the kinds of constraints, difficulty, when are we going to find the situation in which a utility can say honestly that we are unable to find storage.

Dr. MEYERS. We are certainly going to require that the utility rerack their existing pools and if they come to us at the AFR site without having done that, it is not likely that they will be accepted, so there will be a requirement for them to do what they can to the maximum extent feasible or possible.

There will be an incentive in the pricing structure for them to take care of the spent fuel at their own facilities.

The CHAIRMAN. Officials from your Department and the President have indicated that there are two pieces of legislation now before the Congress which could implement this away-from-the-reactor storage policy. One is S. 210, the Johnson bill, and H.R. 2586, the Department of Energy bill.

These bills appear or seem to contradict the President's policy in a couple of respects. One, they put responsibility for interim spent fuel storage on the Federal Government; second, they provide for long-term programs under which all spent fuel would be accepted for storage in Federal facilities instead of short-term limited programs to take care of emergencies.

Why is the administration supporting these bills?

Dr. MEYERS. I believe the one bill is the one we submitted, the Spent Fuel Act of 1979, and as I recall the effort there was to provide the limited capacity we are talking about.

Senator Johnson's bill is one that will provide facilities. It has some different terms; as I recall, and we do not agree with all of the terms that are in there, but as of now the bill we have proposed and the one Senator Johnson has proposed seems to be the only way anything is going to get through at all.

I recall one of the differences between the bills was the provision that DOE take title to the spent fuel at the pool of the utility, and then be responsible for transporting it.

Our bill provides for the utility to be responsible for the fuel and the utility deliver to a Government AFR.

So there are parts of Senator Johnson's bill that we do not agree with and that is one that I can remember. But the aim that we are shooting toward is to have limited availability that is associated with prudent management of the electric utilities of the country, and that means to provide the AFR capacity where the utility cannot.

It does not mean it will not but it cannot; but we will certainly insist that they rerack their existing pools to the maximum extent possible, and when they come to the Government AFR, they will have to show that they have no other alternative.

The CHAIRMAN. Is the Department giving any serious thought to combining the problem of toxic waste storage, other chemical storage with low-level nuclear waste?

Dr. MEYERS. As a policy matter, it has not surfaced to the point where the political hierarchy of the agency will be able to address it. I have had phone contacts with the EPA and we intend to meet with them as soon as the official comes back from vacation to discuss just that.

As you may recall, the job I had previous to this job, a couple before this, I was the Deputy Assistant Administrator for Salt Waste, EPA, and I am quite familiar with their activities there.

The CHAIRMAN. Do you agree that there are a lot of similarities with the chemical waste and low-level toxics?

Dr. MEYERS. Clearly the direction one has to go to find a suitable site and the cautions one has to take are quite similar.

Now, we would not, I do not think whatever we develop, we will not ram anything down the State's throat, but we ought to provide the option for a State in developing programs, to colocate if they felt that was in their best interest.

The CHAIRMAN. Mr. Cheney?

Mr. CHENEY. I would like to follow on if I might on this question of spent nuclear fuel. Can you tell us this morning what the Department of Energy has learned from the international fuel cycle evaluation that was recently completed?

Dr. MEYERS. As I recall, there was a subgroup that did worry about spent fuel, but as you may or may not know, it is not one of the technically critical problems. There are, unlike geologic disposal, there are literally some several hundred spent fuel storage facilities around the world.

Some have been in operation for 20 or 30 years so from a point of view of a well-known technology, spent fuel storage fits into that category. With regard to the alternative fuel cycle, I myself am not familiar with what came out of that particular part of the exercise, but as best I know, the information that did come out of that program, the international program, did not affect our plans for spent fuel storage.

Mr. CHENEY. Speaking as a layman, I had the impression that one of the things that came out of that evaluation was some question about our reprocessing status.

There seemed to be a lot of support for that process.

Dr. MEYERS. Again, there are, as you well know, several European countries who did reprocess and take orders for reprocessing. As you also know, it is the position of this administration to indefinitely defer reprocessing, and that is where we stand. I do not know what will come of it.

The President did say that he will reconsider that position after the international fuel cycle program exercise is completed and it may change.

Mr. CHENEY. Do you have any idea when that reevaluation on the part of the President will occur?

Dr. MEYERS. I understand the exercise is to be completed within the next several months and sometime thereafter the President will address it.

Mr. CHENEY. Are you aware of any other foreign governments that plan to reprocess their spent fuel?

Dr. MEYERS. We have been working with some. The Germans have had a plan to build a reprocesssing plant that was put off, I believe for political reasons. Whether or not they still feel that they want to proceed I do not know.

I do know they are planning to build the facility at Gorleben, but it was postponed. I do not know if they are not going to ever, but I do know, they had planned to build an entire fuel cycle center that would have cost on the order of $6 billion to manage the entire fuel cycle, manufacture the fuel, reprocess it, and store the waste at the site.

Thus far they are only proceeding with characterizing the site for waste disposal.

Mr. CHENEY. Is it not true that a lot of our current storage problems in terms of the need to find ways to store spent fuel stem in part from the decision not to go forward with the spent processing?

Dr. MEYERS. I think the IRG and the subgroup that supported it clearly stated it was not necessary to reprocess for waste management purposes.

Mr. CHENEY. We would not need as much storage capacity if we had in fact gone foward?

Dr. MEYERS. Probably not. The main difference is that spent fuel has the plutonium and uranium in it. So containment would have to be assured for a long period of time. The volume or quantity would be affected. It might even be larger if you reprocess because of the constraints of manufacturing a waste log of some solidified material.

Mr. CHENEY. That is not consistent with some testimony we had last year when we were informed that reprocessing was one of the best ways to deal with problems of spent commercial fuel.

Let me state before I yield back the balance of my time a very strong feeling that the President put the whole question of reprocessing on hold pending the outcome of this international fuel cycle evaluation, and a question now that comes to my mind is whether or not he plans to pay any attention at all to the results of that study or whether he plans to bury it and continue to defer any decision on reprocessing.

Dr. MEYERS. I would expect that the President will pay attention to the results of that particular group. He was instrumental in setting it up; and as I recall he was at the opening session to start it off, so I see no reason why he would not pay attention to the outcome of that particular meeting and I would fully expect he would reassess the position.

Mr. CHENEY. I yield back.

The CHAIRMAN. Mr. Kostmayer?

Mr. KOSTMAYER. It is my understanding that the date for the first site to be selected by the council is 1985. Is that right?

Dr. MEYERS. The council will not select the sites. The council is currently established as an advisory committee.

The Department's plan calls for the identification of sites by 1985, and we expect to have perhaps two, three or four identified by that time, and if you recall in the testimony we talk about a regional area and then cite a specific kind of analysis that would quantify our studies to various sites around the country.

Mr. KOSTMAYER. Is it so that 11 of those sites have already been picked, at least on a preliminary basis? I am speaking of locations in Mississippi, Louisiana, Texas, New Mexico, Utah, Nevada, and Washington. Is that accurate?

Dr. MEYERS. Well, 11 sites are under characterization, but if you look at the gulf coast salt domes, for example, it may be that one of those survive as a possible candidate site selected in terms of the four or five that the President asked to have fully characterized.

The former WIPP site in New Mexico and the site in Utah, in bedded salt, might also be a proposed site should the characterization studies so show.

Mr. KOSTMAYER. What is the target date?

Dr. MEYERS. The date is 1985.

Mr. KOSTMAYER. Why so long?

Dr. MEYERS. We have been working on the bedded basins and the gulf coast domes, and we expect to be able to select one of the gulf coast domes, by 1981. The President has asked to look at more sites and it may take several more years to characterize the other sites.

Mr. KOSTMAYER. Just a slow process?

Mr. MEYERS. It takes initially a paper study of the geology of the area. Then you must get into hydrological studies of the area. Then you end up with boreholes. The schedule I have talked about would be expected unless at some period of time the NRC proposed regulations, which require a full-size shaft down to the working horizon as part of the program are adopted.

The schedules that we put out have not factored that in, since those regulations are not in force yet. It is just a time consuming process.

In addition to what you have to do technically, we are trying through devices like the State planning council in a generic sense and working with individual States to bring the States into the program very early on.

That also takes time, just setting up the mechanism within a State so that they can provide the necessary technical overview of the programs we are proposing, without having it appear that the Federal Government is just trying to rule the States also takes time.

It is just a time-consuming program.

Mr. KOSTMAYER. The INFCE is predicting a sevenfold increase over the next decade in the amount of plutonium, 500 tons, which they expect to be generated around the world.

Does this mean our Government policy of restraint has failed? We don't seem to be able to slow this down.

I wonder if we are being entirely realistic.

Dr. MEYERS. I cannot answer that question, but I would suspect that it will be those kinds of considerations that the President takes into account when he reassesses his position on no reprocessing, but I do not know.

Mr. KOSTMAYER. Thank you.

Thank you, Mr. Chairman.

The CHAIRMAN Mr. Lujan?

Mr. LUJAN. This whole thing seems to be in starting out drilling holes all over the country like a giant step backward. We know what is under the Hanford Reservation or somebody should and does.

The same thing with Nevada; so we start all over, going all over the country spending money drilling holes.

How many hundreds of millions is in your budget for drilling holes?

Dr. MEYERS. I do not know explicitly for drilling holes, but the budget has a total of $248 million for the geologic site programs.

Mr. LUJAN. Why are we going to Government sites when we have already contaminated sites owned by the Government that would serve the purpose?

Dr. MEYERS. The constraint on where one locates a geologic repository should not rest solely on whether or not the Government owns the site or whether it is already contaminated.

We ought to be looking for the site that in the aggregate is best from the standpoint of all parties and the geology, hydrology, so that you essentially have a facility that you can assure the public and the Congress that once it is built, will indeed isolate the waste for the times that are necessary, and whether or not that is on a Government facility or off a Government facility, in my mind, is really not important, but as you also well know, we are indeed looking at the Government-owned sites.

If it turns out that the Government-owned site is the best, and when I say the best I don't mean best in the sense that you keep looking for something better than what you got, NRC will have criteria out and of the five sites that we characterized and presumably they will all meet the criteria and you select the one or two that makes the most sense of whatever conditions prevail at the time of selection.

Mr. LUJAN. It seems to me like we are starting off back at square one when we do know a lot of the characters of those sites.

Let me get on to another topic: The mill tailings program, even though I disagreed on the method that moving one pile to someplace else, we did have legislation that spelled out a very definite kind of program.

We named the piles that were to be moved. We authorized sufficient amounts of money to get moving on it. That was 2 years ago,

and still nothing, not one pile, so far as I know, not one shovel full has been moved in the last 2 years.

Where are we going with that program?

Dr. MEYERS. Well, that program, while it is true that we have not actually moved a pile, I believe of the 22 sites that were mentioned in the law, I think only 9 of them actually have to be moved physically.

I think our analyses show that the others can be fixed in place but, as you know, there is a good deal of preliminary work that must be done before one can go in and actually provide the remedial action, and while I don't like passing the buck to another Federal agency, we cannot actually do any fixing until the EPA publishes their criteria against which the program will be judged, and that criteria has not as yet been published.

Mr. LUJAN. We were told when we were asked to pass this legislation specific ways of how you were going to do it. You were going to go to the bottom and put it in a hole and cover it up and wait for another 25 years before we had to move it again, I suppose.

Mr. MARRIOTT. Will the gentleman yield?

Mr. LUJAN. Certainly.

Mr. MARRIOTT. I would like to make a point, which is somewhat appalling. I have been with the EPA on a number of occasions, and they indicate that they have only got one man in their Department working on this part of this program, and he is too bogged down to get to it.

It was supposed to have completed their part in November of last year, and now they are aiming for April or May, and are not certain whether or not they are going to even meet that deadline.

Does your Department have any way to prod EPA along a set of targets specifically and move toward it, or do we wait here for another year or two until EPA gets around to getting more people on this project?

Dr. MEYERS. Well, we do have an Interagency group that EPA is part of that that discusses those issues but clearly the Department cannot require the administrator of EPA to divert resources to a particular program.

As you well know, EPA has a myriad of important environmentally protective programs under way, and we at the Department cannot evaluate which are more important than the others.

I brought it up because I believe the Mill Tailings Act precludes us from doing any actual fixing until those criteria are in place. I do not want to leave the impression that we are all sitting around waiting for that criteria.

We have already identified and done a good deal of work on the four most obnoxious of those sites. The ones I can remember are Durango, Colo., and Salt Lake City, and the others we can move on.

We have to analyze it from an engineering point of view, how do you actually fix it, and write environmental impact statements.

There are a whole range of things under way for taking the next step to provide remedial action. When you talk about actually moving something, this affects not only the mill tailings program but the other remedial action programs we have under way and it

is difficult to fix a particular site that is contaminated, decommission it when you have no place to put the waste.

It is a key issue that we are working with the various States to make sure that if you have a particular site that the Department is ready to do remedial action on, we need you in the State to provide us a dispoal site for that waste. You cannot pile it up in a corner and leave it there.

Mr. LUJAN. The legislation has authority to carry on the cleaning up of the piles by removing the hazardous materials and that is a technology that is there. It has been done, the uranium that is left, the titanium that is left, the uranium, it can be taken out and the reason we understand they have not is that nobody can make any money on it, but I suppose if we are going to spend $300 million to move a pile from one place to the next that is another alternative and I do not know that you would need any additional sites.

I do not know what the EPA position would be of cleaning up a pile. I am sure there would be some regulations that would delay it, but you don't just have the alternative of moving it. You could clean it up, which is a much better solution.

Dr. MEYERS. I agree; there are options in the bill. There is an option in the bill to go after a former owner, if you can find him, and get him to pay the share that the Feds have paid. You could not find those people. In my exprience in myriads of waste programs, there is always some residual waste you have to get rid of, and if you start out with thousands of tons of something like mill tailings and take out an obnoxious contaminant, you end up with a highly concentrated contaminant as opposed to something that is highly dispersed in tons of earth.

Many of those piles can be fixed in place through devices that someone mentioned earlier by covering with various kinds of immobile materials.

Mr. LUJAN. Let me get on to one more subject.

On the AFR, away-from-reactor storage, when you are talking about the Government, don't we have capacity at Barnwell right now, if we decided to use that, and the Government would not have to do anything?

It is my impression that we have a capacity at West Valley, and there are all kinds of facilities now, and we hear that this one utility is having some trouble at one reactor site.

Why does the Government have to get into the AFR business, if those facilities exist?

Dr. MEYERS. They exist. The West Valley facility is not accepting additional spent fuel.

Mr. LUJAN. Barnwell would.

Dr. MEYERS. It is not a licensed facility. As far as I recall, the Barnwell Aerojet Nuclear—whoever the owners are, AGN, withdrew their application for licensing. The Barnwell facility is not just an AFR, it is a fuel-cycle facility that includes fuel processing and fabrication as well. Licensing was stopped right after the President's announcement for no new licensin

We have canvassed the private sector as to whether or not they would be willing to provide the AFR storage capability, and the

answer came back, "Yes, if the Government will essentially assume the risk."

Mr. LUJAN. I hate to come over as the heavy in all the questions I ask, but it clearly shows the frustration we feel, not only as committee members, but as citizens, and I think the whole country feels that way, that we are just not moving along. It is just always one paper shuffle after another. Even this morning on the international fuel cycle evaluation, what kind of a reaction do we get from the administration when they say, look, you guys, you had better face up to the fact that we are going to have to do some reprocessing; the whole world is doing it and we are sticking our head in the sand. Carter administration officials maintain the outcome was not without positive aspects, that it showed that the demand for electricity has dropped sharply.

Now you know, that is looking pretty deep to try to justify the administration action on it, and it just seems to me, one stumbling block after another. Maybe not stumbling blocks, but certainly inaction. It is just not moving. There are, maybe not easy, but there are solutions now to the waste problem. On the low level, there is no problem at all in making the States responsible for their own. Those proposals have been around, and as a matter of fact, I suspect that is where it will all come out in the final analysis, when we are backed down to the wall, and the closet is full of low-level waste. That is what will end up happening.

In the high-level waste, several different locations, rather than trucking it from all over the country out to New Mexico, we might—or any one site, for that matter—we can have six or seven sites, and it is technically feasible.

My understanding has been that reprocessing can reduce volume. The figure that comes to mind just off the top of my head is about a third of the volume is reduced when you reprocess. It seems to me like we are just waiting around and waiting around and we are just not moving. It is a whole administration posture that just has not bottomed out, and there is great frustration in getting the thing moving, make some decision even if it is wrong, we have done that already, but we have to be looking at it in a positive way of getting something under way instead of having more studies. When they have a study, they will say, "Look you guys, you will have to reprocess, move it."

Dr. MEYERS. With regard to the last remark, all the repository designs and development work we are doing is oriented to receiving spent fuel or solidifying high waste. So if the administration changes its policy on reprograming, we will not have to stop and go back and start all over again.

Mr. LUJAN. Thank you, Mr. Chairman.

The. CHAIRMAN. I had high hopes we would be getting into WHIP.

Mr. Marriott.

Mr. MARRIOTT. Thank you, Mr. Chairman.

I would just like to ask where we are heading in the area of deep seabed disposal. Where are we in the R. & D.?

Dr. MEYERS. The date I mentioned in the testimony was by 1983 we ought to be in a position to determine whether or not it is

something technically feasible. There are constitutional constraints there, as well.

We have proposed, I believe, in the 1981 budget, increasing the greater expenditure from about $6 million in 1980 to about $9 in 1981.

Here the program involves the work with, I believe, the National Oceanographic Administration, NOAA, to use their vessels. There are parts of the ocean we are actually exploring in, there are conceptual designs of canisters that can be used for penetration, but it is still in a very early R. & D. stage.

Let me mention one other thing. I sort of put the seabed disposal in the category of a rather old cliche, which is, the less you know about something, the more attractive it looks. In addition, as I mentioned, there will probably be constraints there, as well, the International Law of the Sea Conference, and there are other international organizations involved. While fish do not vote, there are other people who act as surrogates for them.

Mr. MARRIOTT. How far offshore are you talking about?

Dr. MEYERS. I do not recall. I do not remember the exact locations. I remember the diagrams, but I do not know how far out it goes.

Mr. MARRIOTT. In this study of 9 point or $9 million that you are anticipating spending for the study, are you also intending to study interior lakes or salt bed lakes?

Dr. MEYERS. No, these are deep seabeds out in the ocean.

Mr. MARRIOTT. There is no proposal to look at lakes?

Dr. MEYERS. In the United States?

Mr. MARRIOTT. Within the United States.

Dr. MEYERS. Not that I know of.

Mr. MARRIOTT. Are we storing any other nation's wastes at this point of spent fuel?

Dr. MEYERS. We do receive foreign spent fuel that is part of past agreements, at the Savannah River plant, and they are reprocessing it. To that extent, they add insignificant amounts to the waste level we already have.

Mr. MARRIOTT. But we are not making any new agreements?

Dr. MEYERS. I believe we have to check with the Congress before we do that sort of thing.

Mr. MARRIOTT. Will you tell me exactly, as far as you know, where Utah is on your site selection priority list?

Dr. MEYERS. Well, we are exploring, as I said, the Paradox basin there. I know we have done two hydrological studies, and I believe we have some core samples as well. But I cannot tell you where it fares as to continued suitability.

Mr. MARRIOTT. Can you tell me if the MX missile program, if Utah is set as the site, will go ahead with the racetrack program? Will that do anything to alter Utah as a possible site?

Dr. MEYERS. From my perspective—let us just take a theoretical case, and it is only theoretical. I am not sure what the reaction would be if that particular site were acknowledged by the scientific community as being the best and the MX would be there as well. But the approach we are taking right now does not factor in the fact that the MX missile will be located there.

Mr. MARRIOTT. Do you think that should be factored in at this point, since that is the site which is the Air Force's No. 1 alternative? Should that not be a factor? What I am trying to do is let the people of Utah know they are not going to be a nuclear dumping ground. If we are to be a depository now for spent fuel waste, it seems to me as though that is going a little bit too far, and maybe you can consider talking with your colleagues about factoring that in.

Dr. MEYERS. Mr. Marriott, I understand what you are saying, but it would seem to me, every other State would find some reason why, because of what else is going on in the State, they should be excluded from consideration as a nuclear waste repository.

When somebody references it as a nuclear dump, I visualize birds flying around a lot of garbage. This will not be like that.

From my point of view, I would rather run the program where we make determinations based on sound technical judgments and leave somebody else to decide whether for other considerations a particular site should be discarded.

Mr. MARRIOTT. You mean like the politicians?

Dr. MEYERS. Yes, sir.

Mr. MARRIOTT. What fraction of the world's enrichment capacity now does the United States have?

Dr. MEYERS. I have not the foggiest notion.

Mr. MARRIOTT. Do you know what our domestic uranium reserves are?

Dr. MEYERS. I believe Assistant Secretary Davis is supposed to discuss that. I am not familiar with the uranium resource program.

Mr. MARRIOTT. Thank you, Mr. Chairman.

The CHAIRMAN. Mr. Bereuter.

Mr. BEREUTER. Are you familiar with the vitrification program in France? Are you familiar with the physical security innovations which the French and Germans have made in the areas of storage and personnel security?

Dr. MEYERS. Yes, sir.

Mr. BEREUTER. Can you tell us where they stand relative to us?

Dr. MEYERS. With regard to vitrification, the French have a facility in Marcoule approximately 50 or 60 miles from Marseilles. They have been running it for a couple of years.

Mr. BEREUTER. I think I know the answers to those things. What I want to know is how do they rank in comparison to what we are doing.

Dr. MEYERS. We have not run a vitrification plant of the same size. However, we have run vitrification plants which technically can do the same things they have done.

I think they are substantially behind this country with regard to the disposal of that waste. They, along with the other countries of the European Economic Community, are essentially just getting started to looking for the final disposal sites, and because of the soil content and size, various countries have taken a lead. France has granite; Italy, clay—and they are essentially looking in their own countries for permanent disposal sites. That is just getting underway.

As far as the physical security goes, I understand at the Gorleben site they had to build a large wall to keep interested people from crossing over onto the property.

Mr. BEREUTER. Is it true that they have put things in a less dangerous form than we are. We have even been putting waste in a liquid form, which is quite dangerous.

Dr. MEYERS. I have been talking here about the commercial waste form. The reference there is a spent fuel element, except for liquid fuel reprocessing in New York, but we have nuclear waste which has evolved from the nuclear weapons program and we have plans to build a solidification facility to convert that liquid waste into solidified waste.

Mr. BEREUTER. I would like to say, Mr. Chairman, this is one of my most frustrating periods in listening to what we are doing and not doing in the storage of nuclear waste. Some day I am sure somebody will write a study on how we perceive it; it is bureaucracy at its worst. It seems to me that one thing we ought to consider doing is admitting we are to a large extent managerially incompetent to handle this problem. Perhaps we ought not to be putting all our eggs in one basket. We ought to be looking at some of our allies today as to what they are doing and directly contract some of our responsibilities out, since we are not capable of handling it; tie ourselves into those R. & D. developments abroad, so we have the ability to leapfrog managerially. When we have some changes in the policy of what we are going to do as to the storage of nuclear waste and reprocessing, maybe we can capitalize on what we have done abroad by putting our money in it. I offer that as a suggestion; maybe it is not unique.

The CHAIRMAN. I share the gentleman's frustration. We are all concerned. I thought last year, after Three Mile Island, we would be able in the summer and fall to be able to take steps. Last month I introduced my own version, because I could not get committee consensus as to what policy should be. I proposed action despite a long and sad and sordid tale of congressional inability to make judgments and decisions in these areas.

There has been a time or two when we have done the right thing. I mentioned this morning the Alaska gas line, involving a $10 or $15 million gasline, which included the Canadians pacifying their people; providing for court review. We made a decision, but we have not built a pipeline yet. That is why I am frustrated with the fast track matters. All we seem to be doing is creating a new very expanded bureaucracy between the DOE and White House with all kinds of supergrades and additional positions, scientists and lawyers, to slow down the whole process of making decisions on energy matters.

What I thought would be a fast track has turned out to be what I fear may be a slow track. So I share some of the gentleman's concerns.

The CHAIRMAN. Anything further?

Mr. CHENEY. Mr. Chairman.

The CHAIRMAN. Mr. Cheney.

Mr. CHENEY. I would like to follow up on the tailings program.

It is my understanding one of the nine high-priority areas to be cleaned up are targets EPA and DOA felt ought to be on the priority list.

Dr. MEYERS. I can certainly find out.

Mr. CHENEY. You mentioned that the need for an EIS statement to be done on that, before anything else can move forward. It was my understanding that there had already been comprehensive studies done. You mentioned that you were also interested in getting State cooperation, the possibility of deciding where some of the waste might go. One of the problems we have been having in Wyoming is getting answers from the Department of Energy. The Governor has written a letter, a copy of which I have. His letter states as follows:

DEAR DR. MOTT: On August 22, 1979, a member of my staff telefaxed to you a list of specific questions relative to the captioned program, questions which we felt should be answered before embarking on negotiations for a cooperative agreement for remedial action. I understand that subsequent to that correspondence, officals from the Wyoming Department of Environmental Quality met with you and your legal counsel to discuss our questions. Nearly 6 months have elapsed since that meeting and still we have received no definitive answers.

This letter is dated February 13, by the Governor of Wyoming, Mr. Herschler.

I wonder if that is typical of the kinds of problems?

Dr. MEYERS. It is the first instance I have heard of. The manner in which the program operates at the Department of Energy, the gentleman you mentioned, Mr. Mott, is part of our Assistant Secretary of the Environment organization. They have a front-end responsibility to characterize a site and let us know its status of contamination. We then will make arrangements as to the actual fixing of the site. The third phase is for them to come back and certify we have done the job in accordance with existing criteria. I cannot answer your question right now, but I will find out why the response has not been made.

Mr. CHENEY. They are basically interested in knowing what requirements are necessary. The date of the followup letter is February 13, 1980.

Thank you, Mr. Chairman.

[The Department subsequently furnished the following information:]

In the formal designation of the mill tailings sites by the Secretary of Energy on November 8, 1979, a total of 25 sites were designated. The Riverton, Wyoming, site, along with eight other sites, was assigned a priority of "high". Six sites were assigned a priority of "medium" and the remaining ten sites were classified as "low" priority. Within the high priority category, the sites at Canonsburg, Pennsylvania; Salt Lake City, Utah; Shiprock, New Mexico; and Durango, Colorado, have been singled out for initial remedial action based on proximity of population, the condition of the sites, and potential health effects. For planning purposes, these four sites will be treated as a group, and insofar as possible, remedial action will be performed in parallel at these sites.

In our current preliminary planning, the site at Riverton, Wyoming, would be one of a second group of two sites on which remedial action would be undertaken as soon as possible following the initiation of work at the above sites.

The CHAIRMAN. Mr. Kostmayer.

Mr. KOSTMAYER. Both the Hart bill and Udall bill make a connection between the continued licensing of nuclear plants and the resolution of the waste disposal problem. Does the administration concur that is a good relationship or not?

Dr. MEYERS. As far as I know, the administration feels that the pursuit of the waste program should be independent of the future course of nuclear energy. So, we prefer that there not be that tie.

Mr. KOSTMAYER. Does not that provision in both bills provide a good incentive to solve the waste disposal problem, agree on a solution, and begin actually to do something about it before we begin——

Dr. MEYERS. We clearly have a program underway, and while it is true much of the program at this stage of the game is R. & D. studies, research and development, I think it is important for everything to understand that absent this kind of work we would not be able to move forward with any program. We spent 2½ years developing a generic program on the waste program looking at 10 ways to dispose of waste and determined that geologic disposal was the best way to go. Absent that kind of environmental impact statement, we would be in court.

So we are laying the groundwork now which would allow us to proceed in a technically conservative way. So to say there is no program and the whole thing is in disarray——

Mr. KOSTMAYER. I have not suggested that. I approve of the administration's prudent course here, but it seems to me there is a logical relationship, and I am wondering why the administration objects to those provisions.

Dr. MEYERS. I guess the objection is related to the fact we feel the problem can be treated in an environmentally sound way.

Mr. KOSTMAYER. But if it cannot be, certainly we should not continue to license nuclear powerplants.

Dr. MEYERS. One of the reasons we are anxious for the AFR legislation, that would allow us to safely manage the spent fuel for an extended period of time while the program proceeds to find the ultimate solution in the form of a disposal site. I see no reason now to say let us stop everything until we have a repository in operation.

Mr. KOSTMAYER. So you do not think the ultimate solution has to be found while we continue licensing nuclear plants?

Dr. MEYERS. You mean having a repository in operation?

Mr. KOSTMAYER. I think so. After all, I think we have been pursuing this problem long enough now to know that simply by doing the things you are doing, the R. & D., et cetera, that does not mean an actual operating solution will occur quickly. We have reason to think the contrary is true.

Dr. MEYERS. You are correct, it is not going to be quick. As a private citizen, as opposed to a DOE representative, I worry about whether that is the best thing for the economy to stop the licensing of plants——

Mr. KOSTMAYER. We have stopped the licensing of plants, have we not?

Dr. MEYERS. As a practical matter; I do not know of a plant that has been licensed in the last year or so.

The CHAIRMAN. Some time ago I wrote the Department of Energy to look into allegations by a former employee who quit at Hanford, Washington, over policy to keep publicity as to leaks in high level waste tanks at a minimum. The Inspector General concluded this was true, that was the thrust of the policy.

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Now last week, Assistant Cunningham testified before Mr. Dingell's committee that the official report said the policy was to keep tank leaks to a minimum, when in fact the report said it was to keep publicity about tank leaks to a minimum. I have been concerned about this.

Has the Department done anything about contractors at Hanford? I understand the Department has one category called confirmed leaker, which requires a press release; another called questionable integrity, which does not call for a press release. It seems as though the Department is trying to weasel under these words and reverse what its own Office of Inspector General had found.

What are you doing on this?

Dr. MEYERS. I have already contacted the office in Hanford and asked them to provide us their plan for addressing the Inspector General's report. They said they would, of course, do that, but they asked if they could wait until another report by the Assistant Secretary of Environment on the same subject is also completed within the next couple of weeks so they can address them together. We picked up very early on when the Inspector General's report came out, and it is a question of how you classify the tanks, and the manner in which the people who operate the Hanford site reacted. If one was of questionable integrity they sealed it off and removed the liquids in it.

The thrust of their particular argument was they were more interested in keeping tanks from leaking into the environment than worrying about whether you classify it one way or the other. But since it has gotten to where it has, we will take action.

The CHAIRMAN. It reminds me of the NRC report we had where they complained of a violent, energetic disassembly; it turned out it was an explosion.

I will leave Mr. Kostmayer in charge.

Mr. WEAVER. If we were operating adequate reprocessing plants, how much would that relieve the problem?

Dr. MEYERS. The spent fuel could go right from the reactor basin to the reprocessing plant. So it would eliminate that step in the process.

Mr. WEAVER. Would all the residues be used, or would some of that have to be stored?

Dr. MEYERS. Eventually as a result of reprocessing you end up with a liquid waste that has to be solidified.

Mr. WEAVER. Quite a bit of the waste we are talking about could be used.

Dr. MEYERS. Presumably one proposes to get out the plutonium and uranium which has Btu content. There would be some product that would be removed, but you would nevertheless have a large amount after reprocessing. The plutonium is what you remove, and it has the half life of thousands of years.

Mr. WEAVER. Are there not others just as long?

Dr. MEYERS. There are——

Mr. WEAVER. But some of these we would not use.

Dr. MEYERS. There would be fission products that have long half lives, but plutonium and uranium have the longest.

Mr. WEAVER. What is the administration's policy on licensing of plants?

Dr. MEYERS. An indefinite deferral.

Mr. WEAVER. Did you have occasion to see the report in the Washington Post this morning?

Dr. MEYERS. I have not read it.

Mr. WEAVER. It said that we should all go ahead very fast in reprocessing and breeder reactors except for Third World countries.

Thank you very much.

Mr. KOSTMAYER [presiding]. Are there further questions? If not, Dr. Meyers, we thank you for your testimony this morning.

We will call now, Assistant Secretary Ruth M. Davis.

Good morning, Madam Secretary.

Please proceed in any way you like.

[The prepared statement of Hon. Ruth Davis may be found in the appendix.]

STATEMENT OF HON. RUTH DAVIS, ASSISTANT SECRETARY FOR RESOURCE APPLICATIONS, U.S. DEPARTMENT OF ENERGY; ACCOMPANIED BY STANLEY WEISS, DEPUTY ASSISTANT SECRETARY FOR INDUSTRIAL AND UTILITY APPLICATIONS AND OPERATIONS, AND WILLIAM R. VOIGT, JR., DIRECTOR, OFFICE OF URANIUM RESOURCES AND ENRICHMENT

Mrs. DAVIS. Thank you. I have submitted a detailed statement which, with your permission, I would like to insert for the record. I have also provided the staff with a very short statement from which I would like to comment.

This morning I am accompanied by Dr. Stanley Weiss, Deputy Assistant Secretary for Industrial and Utility Applications and Operations, and Mr. William R. Voigt, Jr., Director, Office of Uranium Resources and Enrichment.

I am going to be talking this morning about two programs. The first, our uranium enrichment services activity and the second, our uranium resource assessment program.

I consider the major functions of these programs to be:

One. To supply all defense requirements for highly enriched uranium,

Two. To be the sole supplier of all needed enrichment services to domestic civilian nuclear reactors,

Three. To be a principal supplier of enrichment services to non-U.S.—free world—utilities,

Four. To utilize the most reliable, safe and cost-effective technologies available, and

Five. To develop and disseminate information on the magnitude, availability, and economics of U.S. uranium resources, as well as to participate in international efforts to evaluate foreign uranium resources.

We have supplied all of the highly enriched uranium requirements for the naval nuclear propulsion fleet since 1957. These requirements represent about 10 percent of our current annual production. We are the sole supplier of all enrichment services to domestic civilian reactor consumers. Until recently, there has been no competition for the U.S. market. However, now Urenco and

Eurodif have sales representatives in Washington seeking a share of the U.S. enrichment business.

We have many reasons for wanting to be a principal supplier of foreign enrichment needs. These include our desire to: One. Exert the maximum influence on foreign users to cooperate in our nuclear nonproliferation objectives by obtaining enriched uranium from the United States rather than by developing an indigenous supply capability, which could also be a source of weapons material; two, obtain the benefits from this program in U.S. balance of payments; and three, optimize available capacity so as to minimize the cost for all customers.

In the international market today we see three existing and three potential non-U.S. suppliers in the international market. Although their marketplace service capacity is now small compared to the United States, they intend to increase such capacity during the next decade.

At the moment, the United States is experiencing a decline in its share of enrichment services for the world market. Some foreign customers have switched from DOE to Eurodif, Urenco, and the Soviet Union and additionally, some new business may go to foreign suppliers as well. This concerns us. To reverse this trend we have and we are visiting our foreign customers to demonstrate our desire to meet their enrichment needs with more favorable terms than our competitors.

To assure our domestic and foreign customers that we are the most economical and reliable source of enriched uranium, we are working with all available technologies. Specifically, we have under way a major effort to utilize gaseous diffusion technology, and gas centrifuge technology, and DOE is financing R. & D. on advanced isotope separation technology.

In addition we have two programs under way, the cascade improvement program (CIP) and the cascade uprating program (CUP), which are now the most economical way to increase our uranium enrichment capacity. These programs will be completed in fiscal year 1981 for Oak Ridge and Paducah, and in fiscal year 1983 for Portsmouth.

To further assure our domestic and foreign customers that the United States is the most economical and reliable source of enriched uranium, we will complete the first 2.2 million SWU's of the gas centrifuge enrichment plant (GCEP) by 1988. The remainder of the plant will be scheduled based on demand. This will permit GCEP to be operated integrally with our gaseous diffusion plants, and to bring to the enriched uranium marketplace the real advantages of the centrifuge separation process.

In addition, a major research and development effort is under way in advanced isotope separation (AIS) technology. One plasma separation and two laser methods are under evaluation in DOE.

As you know, we are also conducting a uranium resource assessment program. We want to continue that program to:

Assure adequate domestic uranium supplies for current and planned light water reactors.

Provide a measure of the light water reactor capacity supportable from domestic uranium supply over the long term.

Provide a basis for timely and economic decisions about developing and deploying other energy technologies, such as reprocessing, recycle of uranium and plutonium, and advanced reactor designs.

Assure other countries of the adequacy of uranium supplies so that premature or unnecessary use of technologies leading to weapons proliferation can be avoided.

We see resource assessment as a proper government activity because it requires longer term studies than do typical industry programs, and it also involves resources which industry is not actively investigating. The current estimate of total uranium reserves and resources—excluding byproduct—is 4.1 million tons U_3O_8. Of this total, 46 percent occur on lands in the public domain, and 11 percent occur on Indian lands. DOE is actively involved with other Federal agencies which are evaluating the wilderness potential of lands in the public domain.

I would like to take a moment to discuss the actions I deem important which occurred in fiscal year 1979 and fiscal year 1980.

Our major gaseous diffusion technical accomplishments are those involved with the cascade improvement and cascade uprating programs (CIP/CUP). The CIP/CUP, slated for completion at Oak Ridge and Paducah by the end of fiscal year 1981, is on schedule.

Because of a recent 227-day strike at the Portsmouth plant, that portion of the CIP/CUP will be completed in fiscal year 1983.

We have also made some important achievements in the centrifuge program. We have a centrifuge machine design which this year will be qualified for production. Extensive development and qualification tests are ongoing, and we are obtaining valuable operating experience and test data.

The GCEP project is on schedule. Eight of the original twelve architect engineering firms have completed design on their portion of the project. Eight major construction contracts have been completed and 10 others are underway.

In terms of production, in fiscal year 1980 the three gaseous diffusion plants will operate at an average power level of 3,011 megawatt-years. Production from the three plants at this power level will be 10.6 million SWU.

During fiscal year 1979, 80 percent of DOE's long-term, fixed-commitment customers converted to the new adjustable, fixed-commitment (AFC) contract. In addition, DOE also signed three new AFC contracts. As of January 1, 1980, DOE has a contract commitment to supply 304 GWe of nuclear power—about 200 GWe with U.S. utilities and 104 GWe with non-U.S. customers. Our production plan is based on supporting, both domestic and foreign, 161 GWe of nuclear power capacity by the end of 1985; 227 GWe by the end of 1990; and 294 GWe by the end of 1995.

We have had a few problems this year. Ten of our enrichment service customers—one domestic, nine non-United States—have terminated their contracts with DOE in fiscal year 1979, and additional contracts may end this year as well. Reasons for terminations include reactor cancellations, licensing delays, desires to diversity supply, needs to support national enrichment programs, and perceived uncertainty resulting from U.S. nonproliferation policies. We are encouraging customers who no longer need enrich-

ment service contracts to assign their contracts to other customers, if possible, rather than to terminate.

During 1979, the local oil, chemical and atomic workers union at the Portsmouth gaseous diffusion plant were on strike for 227 days—from May 3, 1979 until December 16, 1979.

The major result of the strike, as I indicated earlier, will be a slip in the completion date of the Portsmouth plant CIP/CUP construction program from the end of 1981 to mid-1983.

In fiscal year 1979, we made substantial progress in data gathering of the national uranium resource evaluation (NURE) program and in making the transition to the quantitative evaluation of resources based on those data. We modified our program strategy to assure first priority for quadrangles with the largest potential to increase our resources. In addition, we also began assessing sites considered favorable for types of deposits found in other countries—world class—and of intermediate grade.

Our cumulative data gathering in fiscal year 1979 involved airborne radiometric surveys totaling 780,000 miles of the 1,100,000 planned. In addition, hydrogeochemical and stream sediment samples have covered 1,900,000 square miles. We completed detailed evaluation of these data and other available information and quantitative resource assessments in the first 18 quadrangles. Quadrangle evaluation and assessment will be an increasing part of the program; we will assess 116 priority quadrangles by the end of fiscal year 1980.

Fiscal year 1981 budget request. The DOE's fiscal year 1981 budget request for the uranium enrichment activities program is shown in charts 2, 3 and 4 of the summary statement. Chart 2 breaks down major program components. Chart 3 breaks down the revenue sources used to finance the major portion of the budget and our fiscal year 1981 request. As chart 3 shows, a significant portion of the fund requirements for the program comes from revenues—about 94 percent; however, we need a net appropriation of $87,541,000 or 6 percent of the program requirements in fiscal year 1981. Chart 4 compares the fiscal year 1980 and fiscal year 1981 budgets. The major increases in our uranium enrichment activities request this year are for gaseous diffusion, primarily cascade power, operations and maintenance costs, and the costs of starting several new construction projects.

The increased cascade power budget reflects a 22-percent increase in the unit cost of power, including $43 million in demand charges. DOE is negotiating with its three power suppliers to try to reduce or eliminate the demand charge payments.

Our budget request for the uranium resource assessment program is shown in chart 5. The fiscal year 1981 requested budget authority of $35.8 million is a decrease of $28.9 million from fiscal year 1980. The National Airborne Radiometric Reconnaissance Survey will be completed as planned during fiscal year 1981, and the survey results will be open filed in fiscal year 1982. We will, however, stop conducting a systematic National Hydrogeochemical and Stream Sediment Survey. We will do future sampling selectively in field sites for which geochemical data are specifically needed to maintain an acceptable level of geologic data upon which to base resource estimates.

The lesser amount of funding will slow the program and completion of the national assessment will be delayed 3 to 5 years beyond the 1985 target contained in the fiscal year 1980 congressional budget submission. This reflects a somewhat lessened urgency about finishing a comprehensive study of uranium resources due to reduced demand and the need to decide about large-scale commitments to advanced nuclear systems.

A detailed discussion of the budget for both programs is contained in my detailed statement submitted for the record.

Present health of program. As concluding comments, let me assess the health of the programs.

Overall program activities are proceeding smoothly and on schedule. Our production planning will balance supply and demand, with adequate flexibility to assure that we can respond to increased military and civilian needs. Within the short term, production of low enriched uranium will slightly exceed demand. I do not believe that this is cause for concern; it may enhance our reliability as a world supplier.

Recognizing that the demand for enrichment services is highly uncertain, we are increasing our efforts to understand the marketplace, and to pursue the most cost-effective production mode.

The diffusion complex will continue to be the major portion of our enrichment capability. Rising costs of electricity for the plants may require us to replace some of this capacity with more energy-efficient processes such as gas centrifuge or, in the longer term, advanced isotope separation methods. We are monitoring this situation closely, and will recommend appropriate action to the Congress if we feel replacement is warranted.

I believe our contracting posture is now good, and the terms and conditions under which the United States offers its enrichment services are the most favorable in the world. We do not intend to relax our efforts to aggressively sell our services, or respond to customers' needs. I believe we are in a strong position both technically and managerially, and I believe our perceived image in the world is still that of the dominant supplier of uranium enrichment services.

This concludes my summary statement, Mr. Chairman and members of the committee. I would be happy at this time to answer any questions.

Mr. WEAVER. Madam Secretary, you said something was delayed. What was that?

Mrs. DAVIS. I said in our national uranium resource assessment program, the decreased amount of the budget authority we are requesting would delay by about 3 to 5 years completion of the comprehensive survey of the national uranium potential.

Mr. WEAVER. I did not realize how much less electricity the centrifuge process takes. One of my main criticisms of nuclear power has been the enormous amount of energy it takes to operate it. I see that as a step in the right direction.

Do we know the centrifuge process works?

Mrs. DAVIS. They have been through what I would call technological demonstration, meaning their technological feasibility is established. We also have at Oak Ridge prototype development facilities which are now operating at a somewhat lesser scale.

Mr. WEAVER. What scale?

Mrs. DAVIS. I am not sure—this kind of construction in the gas centrifuge plant has a very remarkable ability of modular additions, so we can add on or can start out with what we call a 1.1 million separative work unit module and then add on.

Mr. WEAVER. So you are saying that the pilot programs you have are really almost component programs of the larger programs?

Mrs. DAVIS. Yes. We are going on line in our operational plan with just two of these modular units to give us 2.2 million separative unit capacity. What we are operating is a small subset of that capacity.

Mr. WEAVER. In your testimony, the first of these plants will be available in 1988?

Mrs. DAVIS. In 1988, we will be on line with a 2.2 million SWU's of separative capacity. What we have operating now is a 50,000 SWU facility. These machines have been scaled-up in terms of individual capacity and will be replicated in cascade to meet production capacity at Portsmouth.

Mr. WEAVER. Would we then phase out the gas diffusion plants?

Mrs. DAVIS. No. The capacity that we are aiming for which combines the gaseous diffusion plants and the gas centrifuge plants is based upon our demand projections. We cannot, therefore, phase out the gaseous diffusion plants while we still have this level of demand.

Mr. WEAVER. You stated in your testimony the policy of the Government is to be the supplier of uranium to the free world.

Mrs. DAVIS. That is right.

Mr. WEAVER. In chart 1, it lists the countries and the numbers of reactors. These are not the number of reactors we have now?

Mrs. DAVIS. I beg your pardon?

Mr. WEAVER. The United States does not have all these reactors, for instance.

Mrs. DAVIS. This projection on through about 1995 and——

Mr. WEAVER. This is what you anticipate the potential market to be for our enrichment in 1995?

Mrs. DAVIS. Yes; because we have to project our demand ahead. It takes about 6 or 7 years to get 2.2 million separative work unit capacity on line. So, we have attempted to predict ahead very firmly through 1985, somewhat less firmly through 1990, and project demand beyond 1990 to help us plan our production schedule through 1995.

Mr. WEAVER. I am still not clear about this. It says France, three reactors.

Mrs. DAVIS. These are the ones anticipate will be buying their enrichment services from us.

Mr. WEAVER. Why do you anticipate this? How do you determine that?

Mrs. DAVIS. It is based on what we have done for 3 years now on what we call a country-by-country and reactor-by-reactor analysis. It also takes into account the potential of the countries to develop their own enrichment capacity. France is very active. It has enrichment plants on its own.

Mr. WEAVER. What are they?

Mrs. DAVIS. Diffusion. We have the most advanced technology. As far as I know, in the free world, we also have the most advanced gas centrifuge technology.

Mr. WEAVER. Do the Russians have one?

Mrs. DAVIS. They have enrichment capability, but to my knowledge, not centrifuge capability.

Mr. WEAVER. I understand that chart. I want to go to chart 3, and find out the kind of subsidies the general fund is providing these enrichment services. A very small slice of the pie is appropriated.

Mrs. DAVIS. That is right. We generally have tried to run this as a business where our revenues match our expenditures.

Mr. WEAVER. Quite a few of our facilities go into making military-grade material. Is that included here?

Mrs. DAVIS. It is less than 10 percent for the naval reactor program, and not a very high percentage for the weapons program.

Mr. WEAVER. Excuse me. I am not following you.

Mrs. DAVIS. It is a small percentage of our overall capacity which goes into supporting our naval reactor program. That is our military reactor program.

Mr. WEAVER. How about hydrogen bombs?

Mrs. DAVIS. That kind of material is kept in our inventory as needed, and we are not supplying any material for weapons currently.

Mr. WEAVER. You are not in this enrichment program supplying——

Mrs. DAVIS. Currently supplying. Military is not building up their nuclear weapons.

Mr. WEAVER. They are not?

Mrs. DAVIS. One has to be careful. We are talking about uranium now, and not other weapons material.

Mr. WEAVER. I see. I follow you.

So what is total enrichment revenues?

Mrs. DAVIS. That is a phrase one uses that says these are the charges that the commercial customers pay. The customer service charge.

Mr. WEAVER. What you are saying is, down to a small fraction, what we charge the utilities both in this country and in the world pays for this program?

Mrs. DAVIS. Yes.

Mr. WEAVER. There are no hidden subsidies?

Mrs. DAVIS. No; not to the best of my knowledge.

We attempt to have our revenues match our costs. Under the various acts that govern this, there are explicit requirements as to recapturing capital, et cetera.

Mr. WEAVER. Thank you very much.

Mr. KOSTMAYER. Mr. Bereuter.

Mr. BEREUTER. Thank you, Mr. Chairman.

Ms. Davis, I found your comments on page 7 about the problems of contract terminations to be quite interesting. How has this affected your revenues or your projections of revenues?

Mrs. DAVIS. Our projections of revenues have decreased. We asked for a supplemental in fiscal year 1980 to cover some $253 million of revenue less than we had anticipated. We obviously have

adjusted our fiscal year 1981 production goals to attempt to meet not only the known reduced demand, but our anticipated reduction in demand, and we are asking for only, in rounded numbers, about $87 million for fiscal year 1981.

If our projections are good, and we think they are very good, although they cannot be perfect because the marketplace is not freely determining the requirement. Our revenues, although they would be less than previously anticipated, would cover all the upgrading and associated costs with the programs, and our revenues would be increasing because we are increasing the demand for services is increasing.

Mr. BEREUTER. Yet, you had 10 contracts terminated recently. How many contracts do you anticipate will be terminated during the upcoming fiscal year?

Mrs. DAVIS. We are working with the companies or the organizations to which we supply uranium enrichment services. We had factored in, not so much a termination, but what I would call intended delay in the obtaining of the enrichment services into our fiscal year 1981 and later-year forecasts. We have been going on trips in attempts to discuss with existing customers as well as to obtain new customers, and it would be my hope that last year would be the peak of unexpected terminations caused by the Three Mile Island incident and nonproliferation concerns.

Mr. BEREUTER. I hope you are right. Is it true that some of these people who were contracting with you are now terminating and going to France for that kind of service?

Mrs. DAVIS. We have three competitors operating now in the international marketplace. We still have about 75 percent of the free world's uranium enrichment capacity. So there is an upper limit to the amount of terminations that can occur because there are not the near-term enrichment services to provide them other than ours. We have attempted to factor that into our determinations.

Mr. BEREUTER. Mr. Chairman, I have a letter from Mr. William R. Voigt, Jr., Office of Uranium Resources and Enrichment, to Ambassador Gerald Smith, Department of State. I would ask unanimous consent it be made a part of the record.

Mr. KOSTMAYER. Without objection.

[The information may be found in the appendix.]

Mr. BEREUTER. I will read only excerpts from it:

> I would also like to call to your attention an area of potential problems, falling not only on this Office, but more so on the Government of the United States. The problems concern our foreign customers' perception of the U.S. capacity to effectively deliver the product to our customers. Specifically, I am making reference to a trend which may be starting whereby foreign purchasers are terminating their contracts with the Department of Energy, due primarily to customers' objections to U.S. non-proliferation criteria and uncertainties regarding the timely issuance of export licenses.

Further down they are talking about the Badenwerk utility as well as representatives from Euratom, who:

> Came to Washington to explain the rationale for the Utilities Corporation decision. As the conversation ensued, the representatives from the Federal Republic of Germany stressed that they were extremely pleased with the quality of the product, the timeliness of deliveries, the terms and conditions of the contract, and the price per SWU. They further reiterated the decision to terminate was based on what they termed "security of supply," meaning their lack of confidence not in the U.S. ability

to produce the enriched uranium on the desired time schedule, but in their ability to obtain a license to export the material. They pointed out that licensing approval is required from a number of branches of the U.S. Government outside DOE, including the Departments of State, Defense and Commerce, the Arms Control and Disarmament Agency, and the Nuclear Regulatory Commission, and that nuclear fuel needed by their reactors could be held up by any one party in this long chain. They pointed out that indiscretionary action such as political changes affecting export licensing is tantamount to a breach of contract.

Finally, in the last portion that I will read:

The representatives from Germany had no hesitation to point out that they were quite willing to purchase fuel elsewhere in the world market, under an assured delivery schedule and even at a price above that of the United States in a market that has a surplus of SWU's. We have learned that they have even entered into a contractual arrangement to purchase SWU's from the Soviet Union as well as from URENCO.

In summary, I believe that they are giving us a serious warning. We still have 17 enrichment contracts with Germany, representing about $1.5 billion in future sales. The total number of enrichment contracts with all foreign customers is 129, and these represent $13 billion in future revenues for the U.S. It is clearly important for us to make a serious effort to avert further contract terminations and loss of revenues.

What we are saying is that, despite the fact that cost is not a factor, they are worried about doing business with the United States.

Mrs. DAVIS. I have Mr. Voigt with me. He works for me. His comments are included in parts of my statement. We are indeed taking actions that we hope will make the United States a better and more reliable supplier.

I would like to cite one of them as a specific instance. That letter was dated April of 1979. In October of 1979 we made a change in our export policy. Before October 1979, customers had to have approval for nuclear fuel exports on an individual shipment basis.

Now we have what we call the 5-year licensing policy which allows those countries with what we call good nuclear nonproliferation credentials to be guaranteed exports roughly covering 5 years without having to go through that process. That means essentially an original load plus four reloads for your reactor or five refills, and it is the kind of comment that Mr. Voigt made in that letter that has led to that kind of change in our export policy.

Along with those comments, the others on my team have brought back similar comments and have led to other changes in the way we are handling our contracts with our foreign customers.

Mr. BEREUTER. I think those changes are certainly advantageous, perhaps overdue, but I still think that is not the basic concern.

The basic concerns are the political conditions in this country and the security of those contracts.

Mrs. DAVIS. That is a basic concern. That is what I call a concern external to the marketplace, and a concern over which, even as a department, we do not have control.

Mr. BEREUTER. I would like to shift a little bit.

Do we have time?

Mr. KOSTMAYER. Go right ahead.

Mr. BEREUTER. What has DOE learned about the foreign uranium reserves from the international fuel cycle evaluation?

What fraction of the world's reserve does the United States have?

Mrs. DAVIS. I would say that the answers to those questions would be difficult, because we are the only country that is conducting what I consider a comprehensive data collection effort to determine our uranium resources. We cannot, therefore, give the fraction of world resources, because the data on world resources outside of the United States is very fragmented and its credibility is low.

Mr. BEREUTER. Are you distinguishing between resources and reserves?

Mrs. DAVIS. I would make the same comment about either. The data decreases in credibility as you go from reserves to probable, possible, and speculative resources. There is no argument on that.

Our latest data would indicate that the United States has about 4.1 million tons of ore in all of the categories of resources that I mentioned, and more explicitly we have about 2.4 million tons of what I would call reserves and probable resources, and I cannot compare that kind of data with the rest of the world because there are different amounts of credibility.

Let me say obviously that we have estimates from other countries, and I would be glad to provide you with the percentage we have of world resources, recognizing that the credibility of the data is widely disparate.

Mr. BEREUTER. The credibility is a substantial question, and it is not an effective comment directed to you, because we just don't know or have a good idea about it.

I did come across an article in the February 22, 1980 edition of the Wall Street Journal, an article, Mr. Chairman, I would like to have this article included in the record.

The CHAIRMAN. Without objection.

[The information may be found in the appendix.]

Mr. BEREUTER. I will read only parts of the first two paragraphs:

> The non-Communist world's uranium-ore reserves will supply its nuclear industry for the next 15 to 20 years but eventually will be depleted if the current light-water reactors aren't replaced by fast-breeder reactors, two nuclear energy agencies warned.
>
> A report drafted jointly by the Nuclear Energy Agency of the Organization for Economic Cooperation and Development, Paris, and the International Atomic Energy Agency, Vienna, said the uranium ore market is soft and prices are relatively low. Nevertheless, it added, exploration and production should be accelerated because demand is bound to rise.

Given the uncertainty of the reserves, and resources, would it not be prudent for us to take a very conservative line to place our best judgment on those reserves and resources? Is it not important that we consider how difficult it is to get those reserves that are available?

Mrs. DAVIS. Yes; however, I would point out that the more precise one's data collection is the less one has to exercise caution or exuberance in the statement of the data.

I believe that with what I would say we now have, which is a sampling and/or surveys of 100 percent of the reserves, and 92 percent of the probable and possible resources and some 55 percent of the speculative or possible resources, we have an ability to be accurate, and in addition to being prudent, I do believe our estimates are both.

Mr. BEREUTER. One final area of questioning.

Do you have information which you could share with us which would tell us the fraction of the world's enrichment capacity that the United States has now, that is projected to have in 1990 and the year 2000?

I am asking this because I am concerned about how much leverage we really do have to influence world policy on reprocessing in the use of nuclear reactors.

Mrs. DAVIS. Yes; let me share with you the data that we have, and I will point out that the statement I will make will be based on what we call separative work units as a measure of enrichment capacity.

At the moment we have capability, and I will give you round numbers, 25 million SWU's of separative capacity. The other three foreign operating companies add up to about 10, so we have, between 70 and 75 percent of the world's capacity today.

Mr. BEREUTER. Does that include the Soviet Union?

Mrs. DAVIS. Yes; the Soviet Union has about 3 of that 10 million SWU that I mentioned to you. I did a quick calculation over the weekend as to what we project, not only for ourselves that we know, but what we project worldwide, and by 1990, again in round numbers, the rest of the world would have 33.5 separate work unit capacities with the Russians having 10 of that, and we would have by 1990 the capability that we have, we have 27 million plus.

We would have roughly 30 if I can round the numbers out for you, so we would have roughly 27 million for 1990.

Mr. BEREUTER. From 17 to 27?

Mrs. DAVIS. Twenty-seven, and then we add 2.2 for the gas centrifuge, so I will go back to my original number, and say we have roughly 30, so that by 1990 my hand calculations show that we would have less than 50 percent of the world's uranium enrichment capacity.

Mr. BEREUTER. First, the obvious, if your projections are correct, there will be more capacity outside the United States than inside, and even if you deduct the Soviet Union's capacity, we will still have 30 (recommended) million as compared to our 27 million, and the rest of the world excluding the Soviet Union.

That is my understanding.

Mrs. DAVIS. Yes; that is capacity; and of course, when you are talking about a marketplace and again let me leave out the externalities, price plays an important factor. Our price, we think, is two-thirds of what the rest of the world's is right now.

Mr. BEREUTER. Part of the capacity, of course, will deal with supplying the nuclear Navy. It seems, that the size of the nuclear Navy is going to be accelerated, along perhaps with the Soviet Union, to have the greatest nuclear vessels, it would seem to me that a large part of our capacity by 1990, and certainly by the year 2000, would be supplied to the Navy.

Do you have any idea how much would be taken up for that purpose?

Mrs. DAVIS. I am not able to say.

Mr. BEREUTER. It would be substantial?

Mrs. DAVIS. I do not think it will be that much of an increase. It takes a fair amount of time to get a submarine off of the launching docks and we are only using 10 percent or less of our capacity now.

We are increasing our capacity substantially, and our capacity is increasing at a much greater rate than the number of nuclear subs that will be able to be even commissioned by 1990.

Mr. BEREUTER. Can you give us anything for the record on that? Does anything exist as to future expenditures by 1990?

Mrs. DAVIS. Yes; we can supply that for the record.

[The Department subsequently furnished the following information:]

The specific quantities and costs of enriched uranium supplied for naval reactors on an annual basis are classified; however, the net separative work content of all enriched uranium supplied to government (including naval reactors) and other non-power users is not. The following table summarizes the projected annual net separative work requirements for government and other non-power users:

Fiscal year:	*Millions of SWU*[1]
1980	1.9
1981	1.4
1982	2.4
1983	1.7
1984	1.6
1985	2.0
1986	1.3
1987	.0
1988	.0
1989	.1
1990	.0

[1] Evaluated at 0.20 percent U–235 tails assay.

The separative work requirements from fiscal year 1987 through fiscal year 1990 are just about equal to returns from government and non-power users, thus, resulting in net separative work requirements of near zero.

Mr. BEREUTER. Would you please indicate at what time that projection was made, post-Afghanistan or pre-Afghanistan?

Mrs. DAVIS. Pre-Afghanistan.

Mr. BEREUTER. Thank you very much.

Thank you, Mr. Chairman.

Mr. KOSTMAYER. I was wondering if there was any inconsistency in the report which the Department issued last month which predicted a substantial short-term fall in demand for nuclear fuel and your projections regarding the number of plants you expect to have on line. 203, I think is the figure.

Have you taken the January report into account in your projections? I do note it says a substantial short-term fall in demand for nuclear——

Mrs. DAVIS. Yes; the January report is our report. It is our projection, and there are two factors at work. One is a delay factor in the short-term of nuclear plants going on line in the United States, and a similar type of delay reflected in foreign reactors going on line.

There is simultaneously the continuation of optimistic projections for nuclear projects coming on line for the year through 1995, so you have a short-term delay or deferral in utilities attempting to pick up this fuel, and the continued belief that there be a substantially increased number of reactors on line, from 1990 through 1995, which is as far as we project.

Mr. KOSTMAYER. Why do you think it will be short term rather than long term?

Mrs. DAVIS. In the United States the holdup has been quite straightforwardly due to the licensing delays, primarily instigated

by Three Mile Island. That is intended to be a short-term hiccup in the nuclear plant online status.

Mr. KOSTMAYER. We had additional problems, I guess; last week or the week before at Three Mile Island, at least reported leakage of other problems in my own State, increased number of children born with thyroid problems, so these problems seem to be continuing, and it seems to me the delay might be exacerbated rather than terminated.

Mrs. DAVIS. Yes; but at the moment it is impossible to do more than any of us can in commonsense. The problems we are having is with one malfunctioning nuclear plant.

Mr. WEAVER. Would the chairman yield?

What I have heard is flabbergasting. You say the delay has been due to your licensing, Three Mile Island?

Mrs. DAVIS. I said part of the delay has been due to the slower than anticipated licensing process, and has been due in part to the delay occurred by the moratorium following Three Mile Island.

Mr. WEAVER. Well, Madam Secretary, wait a minute. The reason utilities are canceling plants all over this country is because of their costs, they cannot finance them.

They cannot pay for those costs. In plant cancellation after plant cancellation they have announced that the costs are just too great, and that is a serious and fundamental issue with energy that you are not addressing here.

Mrs. DAVIS. Costs have to be looked at in several ways.

There is a cost associated with inability to get investment funding, and inability to get funding because of the delays, concerns about returns on investment and the like.

I do not have the data in hand, but the cost of producing electric energy from nuclear powerplants is still the lowest that we have.

Mr. WEAVER. If the chairman will yield further, Madam Secretary, please don't repeat that. The Tennessee Valley Authority is a rather large utility.

Mrs. DAVIS. Oh, yes.

Mr. WEAVER. They have canceled four nuclear plants down there because they find that solar energy and wood waste energy is cheaper. We are finding that out in the Northwest also. I wish people in your position would not continually put out this completely erroneous and false statement that nuclear is the cheapest energy around.

It is one of the most expensive.

Mrs. DAVIS. There are several ways of looking at the reasons for costs and the externalities involved in the development and construction of nuclear powerplants are what is raising the costs, not the costs of the power per se.

The information that I have put on the record will hold, and I would not want to retract it.

Mr. WEAVER. Madam Secretary, I was a builder in civilian life, and I can assure you that the cost of construction and anything we did were amortized into the cost of the product made from that, the rents or whatever, and to divorce the cost of construction from the cost of the product produced——

Mrs. DAVIS. I was not divorcing the costs of the nuclear powerplants from the total but just pointing out the costs identified with

the externalities, the delays, environmental impacts, things of that sort.

Mr. WEAVER. Just for your information, we are producing right now in large amounts, amounts of 50 megawatts of electricity in the Northwest from wood waste at one-half the cost of the projected cost of nuclear power.

Mrs. DAVIS. Right; and I am a strong supporter of that for local and dispersed sources, and I see it increasing in great quantity over the years for local and dispersed sources. I think it is an absolutely essential means for diversifying our energy sources today.

It is in no way inconsistent with either of our previous statements.

Mr. KOSTMAYER. We recognize there is going to be some growth, and you made some predictions in 1977 in the annual report, but the growth is not going to be as extensive as you indicated for that year.

It is going to be about 20 percent below that 1977 prediction; is that correct?

Mrs. DAVIS. I do not know the 1977 prediction. We make those predictions on a year-by-year basis, and our predictions from last year to this year are certainly less, so they were bound to be less in 1977. We are predicting 16 fewer reactors worldwide getting enrichment services from us in 1990, and we are predicting 48 fewer reactors worldwide getting enrichment services from us by 1995.

Just in the 1 year's time we have had substantial weakening in our predictions so that certainly from 1977 to 1979 that would have to have been an even greater decrease.

Mr. KOSTMAYER. You have updated the 1977 figure?

Mrs. DAVIS. We have had three reactor-by-reactor analyses, and are doing this on an annual basis. I am comparing the 1979 to 1980 estimates.

Mr. KOSTMAYER. We are also losing some of our share of the world market, is that right?

Mrs. DAVIS. Yes; we don't have a good estimate of precisely what share we are losing.

We had essentially 100 percent of the free world market. We do not now have 100 percent.

Mr. KOSTMAYER. Yet our price is only two-thirds of the costs others are charging?

Mrs. DAVIS. Yes; because of the technology, and we have large production capability. We do have economies of scale.

Mr. KOSTMAYER. We are losing our share rather than increasing it?

Mrs. DAVIS. The reasons that I mentioned in my statement have been very well identified by several of you, and that is the concern about the United States being able to be an assured and reliable supplier, coupled with an entirely separate factor that always comes in in any area of new technology or new services; that is, the desire of individual countries to have their own indigenous capabilty, and to be as self-sufficient as their resources permit, and one sees that in my field.

Mr. KOSTMAYER. Thank you.

Mr. Weaver?

Mr. WEAVER. Thank you, Mr. Chairman.

I want to commend my two colleagues here for an excellent line of questioning. I did not realize what an impossible, bleak future our enrichment facilities could have here.

In response to the chairman's question as to why we were charging two-thirds of the cost, you said that we had economies of scale. Now, again, as a businessman, you charge what the traffic will bear, not what it costs you to produce.

Mrs. DAVIS. Let me comment, Mr. Weaver.

We operate as a business. In attempting to be efficient, we are not allowed the luxury of operating as a business when it comes to charging.

Mr. WEAVER. To foreign countries? Do you sell any uranium to any of the OPEC nations?

Mrs. DAVIS. I do not believe so.

Mr. WEAVER. Nevertheless, other countries have a way of charging us as much as they can get.

Mrs. DAVIS. The congressional acts specify what the costs are that we can recover.

Mr. WEAVER. To foreign countries?

Mrs. DAVIS. It is a typical Government kind of activity. It is just uniformly consistent policy that you only recover your costs, and that you do not make profit.

Mr. WEAVER. Are part of those costs factored into the decommissioning costs down the road?

Mrs. DAVIS. They would be. We have not decommissioned anything yet.

Mr. WEAVER. You say they are factored in. The GAO report of last September, General Accounting Office report, says you are not putting in the decommissioning costs.

Mrs. DAVIS. That is right; because we are not decommissioning.

Mr. WEAVER. We got to depreciate those plants.

Mrs. DAVIS. We are.

Mr. WEAVER. But not the additional cost of decommissioning them?

Mrs. DAVIS. We would phase that in if we make that decision.

Mr. WEAVER. Why not put it into the contracts today?

Mrs. DAVIS. We could; we have not yet done so.

Mr. WEAVER. Why not? May I point out that you have two scenarios, one, that we will do away with the light water or that type of plant; they will go out of service, and so you will not have a market for your commodity in the future. Or you will not have a market. Therefore, the possibility exists that the few people buying this in the years to come would be faced with paying these decommissioning costs or the taxpayer would.

Why do we not put it in today?

Mrs. DAVIS. Even with the most realistic projected forecasts, we still show the need for our total production capacity through about 1994.

Mr. WEAVER. That is a projection. I am saying, we are charging two-thirds of the cost of other producers, why don't we put in a couple of dollars necessary?

Mrs. DAVIS. As a result of the GAO report the staff is looking into it, and I would anticipate that I would be getting some recommendations.

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They have looked into the other aspects of that report.

Mr. WEAVER. How fast are we amortizing the depreciation on the existing plants?

Mrs. DAVIS. Bill, would you answer that?

Mr. VOIGT. We normally depreciate over a 30-year time frame.

Mr. WEAVER. You include that into the costs of this. Are you starting to factor in the costs of the new diffusion or centrifuge plants now, or wait and add those on in the 1990's?

Mr. VOIGT. Normally we add depreciation as the plant becomes operational. Right now within the charge is interest during construction.

Mr. WEAVER. Would you charge what you are allowed to charge to factor in the decommissioning costs or the cost of those other plants in today's contracts?

Mrs. DAVIS. We would have to get an opinion on that because the GAO report has not given us any legal statement other than a suggestion, and that is one of the things that we would have under analysis and would be asked an opinion on.

Mr. WEAVER. Now, the yellow cake prices have been falling recently. Yellow cake has not fallen.

Mrs. DAVIS. It has per pound.

Mr. WEAVER. You buy the yellow cake, right?

Mrs. DAVIS. It depends on how you look at it.

Mr. WEAVER. You charge just for the enrichment.

Mrs. DAVIS. We provide a service, not material.

Mr. WEAVER. One final question, Mr. Chairman.

Today a report was announced in the Washington Post on the fact that they are going to emphasize reprocessing, and that sort of thing.

Have you factored the possible results of that report if its recommendations are carried throughout the world?

Mrs. DAVIS. Yes; I read the article in the Post this morning.

Mr. WEAVER. That strikes me as a potential of decreasing our market.

Mrs. DAVIS. It could. It pertains primarily to the reprocessing. The concerns there are primarily for the processing of plutonium for weapons-grade material. I think even the Washington Post article, although I am not sure whether it or the report cites that the reprocessing would be uneconomical and was therefore being done on other than economical grounds.

Mr. WEAVER. You say the reprocessing to get reactor-grade material——

Mrs. DAVIS. To get weapons-grade material. I would say the type of processing to get reactor-grade material would not stand up economically.

Mr. WEAVER. So you are not afraid of that at all.

Thank you, Mr. Chairman.

Mr. KOSTMAYER. Mr. Bereuter.

Mr. BEREUTER. No.

The CHAIRMAN. We thank you for your appearance here today, and the subcommittee stands adjourned.

[Whereupon, at 12:16 p.m., the subcommittee was adjourned, to reconvene at the call of the Chair.]

APPENDIX

Additional Material Submitted for the Hearing Record

STATEMENT OF
SHELDON MEYERS
DEPUTY ASSISTANT SECRETARY
FOR NUCLEAR WASTE MANAGEMENT
BEFORE THE
COMMITTEE ON INTERIOR AND INSULAR AFFAIRS
SUBCOMMITTEE ON ENERGY AND THE ENVIRONMENT

FEBRUARY 25, 1980

DOE REMEDIAL ACTION AND SPENT NUCLEAR FUEL PROGRAMS

Mr. Chairman and Members of the Subcommittee, I am pleased to appear before you to discuss the Department of Energy's FY 1981 budget request for the Remedial Action Program and Spent Nuclear Fuel Program. My discussion today will not include comments on H.R. 6390, but I will be happy to participate in a discussion of that Bill at a later date to be scheduled by this Committee.

Before I outline the elements of the subject programs, I would like to review briefly the salient points of the President's policy on nuclear waste management. As you know, this policy is the culmination of the efforts of the Interagency Review Group on Radioactive Waste Management (IRG). Its primary objective is to isolate existing and future radioactive waste from military and civilian activities from the biosphere so as to pose no significant threat to public health and safety. The responsibility for resolving military and civilian waste management problems shall not be deferred to future generations. The technical program must meet all relevant radiological protection criteria as well as all other applicable regulatory requirements. This effort must proceed regardless of future developments within the nuclear industry -- its future size, and resolution of specific fuel cycle and reactor design issues. The specific steps outlined below are each aimed at accomplishing this overall objective.

The key elements of this policy are:

- The establishment of a State Planning Council will provide for a framework, along with other measures, for State involvement in the waste management planning process. The basis of the relationship between States and the Federal government in the siting of high level waste repositories will be the principle of consultation and concurrence. DOE will provide financial and technical assistance to State and local governments to facilitate their full participation.

- DOE will locate and characterize a number of candidate sites in a variety of geologic media for mined repositories capable of accepting both waste from reprocessing and unreprocessed commercial spent fuel. After full environmental review under NEPA, one or more will be selected from a set of four to five sites as a licensed full scale repository.

- Consistent with this policy, the President is recommending that the Waste Isolation Pilot Plant (WIPP) project be cancelled. The site will be considered along with others for possible use as a licensed repository for both defense wastes and commercial high level wastes.

- Interim storage of defense waste will continue to be closely controlled by the Federal government while plans for ultimate disposal in a permanent repository are developed. The safe interim storage of commercial spent fuel from nuclear power reactors will continue to be the responsibility of the utilities operating these plants until a permanent geologic repository capability exists. However, the Administration will continue to press for legislation to build or aquire limited spent fuel storage capacity at one or more away-from-reactor (AFR) facilities for those utilities unable to expand their storage capabilities and for limited amounts of foreign spent fuel when the objectives of the U.S. nonproliferation policy would be furthered.

- DOE will work closely with States, other government agencies, industry, other organizations and the public to establish regional disposal sites for commercial low level waste.

- Regulatory reforms in several areas are called for. The Nuclear Regulatory Commission, the Environmental Protection Agency, and the Department of Transportation are directed to take specific actions that will improve both the efficiency of their regulatory activities and their relationships with other Federal agencies and State and local governments.

Finally, the policy statement calls for the preparation of a National Plan for Nuclear Waste Management, a draft of which will be published for Congressional and public review later this year.

Mr. Chairman, I will now direct my comments to the discussion of the subject programs.

Remedial Action Program

The DOE Remedial Action Program, which is a newly assigned activity in the Commercial Nuclear Waste Program, involves the integration of four programs previously conducted under the Assistant Secretary for Environment (ASEV). The budget request for this program for FY 1981 is $54 million in budget authority, compared to $35 million in FY 1980. It should be noted that this includes $5 million for a proposed R&D demonstration of solidification of West Valley wastes. Remedial actions include: decontaminating formerly utilized sites of the Manhattan Engineering District (MED) and AEC; implementing of remedial actions at the 25 designated mill tailings locations that were authorized by Congress under P.L. 95-604, the Uranium Mill Tailings Radiation Control Act of 1978; continuing remedial actions to remove tailings from about 800 residences, businesses and public buildings at Grand Junction, Colorado; and decontamination and decommissioning programs for DOE-owned surplus research, test, and development facilities that were part of the nuclear development programs of the Department and its predecessor agencies. This later element also includes the development and documentation of decontamination and decommissioning technology for transfer to the commercial nuclear industry.

The Formerly Utilized Sites Remedial Action Program (FUSRAP) consists of projects of remedial action at former AEC/MED-owned or contractor sites and adjacent contaminated properties that have been determined by the ASEV as requiring remedial action to eliminate radiological contamination that may restrict the use of the site. To date, surveys have identified about 30 sites that will potentially require remedial action. About 17 sites have been documented sufficiently by the ASEV to identify them as remedial action projects. No legal authority exists for the Department to undertake some of these projects. At other sites, authority needs clarification. We are therefore preparing to introduce legislation to the Congress in this session to authorize the required remedial action at such sites, and to authorize the acquisition of disposal sites in consultation with affected States. As more sites are confirmed with respect to the scope and priority of remedial action, they would be added to the program as part of the annual authorization.

We conducted remedial action in FY 1979 at one site near Jersey City, New Jersey, to allow commercial development to proceed on a portion of a former site of the Kellex Corporation that conducted research for the AEC. In FY 1980 we are beginning a major decontamination effort at a number of private properties in Middlesex, New Jersey. Our efforts will expand in FY 1981 to progressively plan, organize and implement remedial action projects at high priority sites as determined in conjunction with the ASEV and consistent with current authorization. After the sites are decontaminated, the conditions would be independently certified by the ASEV.

It is anticipated that the uranium mill tailings program will increase in activity in FY 1981. This assumes that the EPA criteria for this program, which must be issued before we can prepare firm specifications, obtain reliable estimates, prepare NEPA documentation, or perform any remedial action, will be promulgated by the end of FY 1980. Our activities in FY 1980 and 1981 will concentrate on high priority sites most impacting the public exposure - Salt Lake City, Utah; Durango, Colorado; Canonsburg, Pennsylvania; and Shiprock, New Mexico. During FY 1981 we expect to complete the environmental documentation and the detailed engineering for these sites and to initiate remedial action at one or more of them. Remedial action consists of removing the tailings to an alternative location where they can be stabilized on property owned by the Federal government and away from populous communities. Other sites will be stabilized in place and the property acquired by the Federal government. In FY 1981 we will continue R&D on removal and stabilization technology and preparatory work on the remaining high priority sites.

The program at Grand Junction is proceeding and is now estimated to be completed in FY 1985. The total number of sites is now estimated to be about 800. This figure is regarded as fairly firm as we are approaching the June 1980 cut-off date for eligibility under this program. The estimated final cost of this program is now approximately $23 million. The State of Colorado has conducted the program efficiently and has shared

25 percent of the cost. Additional Federal authorization of $7.5 million will be required to cover the completion of this program in FY 1981. This authorization is being requested under a separate title of the proposed FUSRAP legislation. If the criteria promulgated by EPA for the mill tailings program are more stringent than those in use at Grand Junction, more sites may become eligible under the Uranium Mill Tailings Remedial Actions Program.

The program to manage and dispose of surplus DOE facilities now includes the reactor, laboratory, test and processing facilities that were determined to be surplus by the AEC in October 1976, as well as facilities that have subsequently been determined to be surplus to current needs. The program covers the surveillance and maintenance of surplus facilities pending their disposition as well as the planning and implementing of projects to progressively eliminate the inventory of facilities and sites that must be managed. Included are the former New Brunswick Laboratory at New Brunswick, New Jersey; the former Lake Ontario Ordnance Works site at Niagara Falls, New York; and other laboratory and test facilities. In FY 1981 the program will provide for engineering planning to decommission the Shippingport Atomic Power Plant near Pittsburgh. This project will provide definitive technology and data on costs and radiological exposure which will be of use to the commercial nuclear industry.

Spent Nuclear Fuel Program

The second program I will discuss is the Spent Nuclear Fuel Program. The budget request for this program for FY 1981 is $21 million in budget authority, compared to $19 million in FY 1980.

These funds are distributed among the program elements as follows:

	FY-1980	FY-1981
Spent Nuclear Fuel		
Domestic Spent Fuel Storage	$ 15M	$ 16M
International Spent Fuel Storage	3	4
Other	1	1
Total Spent Nuclear Fuel	$ 19M	$ 21M

The DOE Spent Nuclear Fuel Program supports the Administration's policy objective of ensuring that spent fuel is stored at reactor sites to the greatest extent possible. As outlined in the President's recent waste management policy statement, the Administration believes that a limited amount of government away-from-reactor (AFR) storage should be provided for those utilities that are unable to find other storage; however, commercial utilities will continue to bear the primary responsibility

for the storage of spent fuel. In addition, the spent fuel program supports U.S. nonproliferation objectives.

As you know, the Department and the Administration have submitted a legislative proposal which would authorize the Secretary to accept and take title to commercial spent fuel and to acquire facilities for the storage of that spent fuel in AFR storage facilities.

DOE is preparing for release an updated report on storage requirements. This data reconfirms the immediate need for AFR storage for U.S. fuel. Six reactors are currently operating without full core reserve capability. DOE firmly believes that full core reserve capability is an important operational flexibility and economic asset.

Based upon utility plans as of June 1979, the requirement for AFR capacity will increase to between 240 metric tonnes (with transshipment) and 620 metric tonnes (without transshipment) by 1983. These requirements assume NRC approval of utility reracking plans beyond those currently approved. If new reracking approvals are not granted, the AFR requirement for 1983 could increase to 1,140 metric tonnes even with transshipment. If all utilities reracked their basins to the theoretical maximum storage density (which may not be possible due to structural limitations or operating constraints), the AFR requirement in 1983 would still range between 170 metric tonnes (with transshipment) and 380 metric tonnes (without transshipment).

Although DOE believes that transshipment is safe, the regulatory and institutional climate has resulted in delays for the utilities in obtaining approval from NRC. For example, Duke Power has been seeking approval to transship fuel between two of its reactors for almost two years. Although the construction of new pools at all reactors requiring additional storage capacity could eventually reduce this requirement, once these new pools were licensed, built and available, DOE analysis indicates that such individual pools would be inefficient and result in higher cost and greater environmental impact than several AFR's which could meet the needs of all reactors. Also, since a date for the shipment of the spent fuel from the reactor site for either disposal or reprocessing cannot be established at the present time, utilities could not accurately forecast individual reactor storage requirements. Under these circumstances, the utilities' ability to plan for, license and provide a sufficient number of new pools is very doubtful. Therefore, the option of interim storage in Government AFR's is a prudent action and should be provided. With any of these scenarios, the amount of fuel stored in the AFR is a small fraction (less than 5 percent) of the fuel stored at the reactors. We believe that this is appropriate, since utilities should provide storage when it is reasonably possible.

DOE has recently completed a study of reracking, at-reactor (AR) and away-from-reactor (AFR) storage which concluded that reracking by utilities is by far the least expensive ($16/kg unit storage cost) and most preferred approach in increasing storage capacity. If new construction is required, AFR's are less expensive ($130/kg unit storage cost) than new AR basins at one to three 1000 MWe unit sites ($320 to $137/kg unit cost).

Storage needs in 1983 and 1984 could be met only through the acquisition of one or more existing storage facilities. If a new facility were constructed, it would not be available until after 1985. No decision regarding the acquisition of existing storage facilities will be made until a site specific environmental impact statement on storage facilities is completed and costs for acquiring facilities are defined. The final generic environmental impact statements on the spent fuel policy will be issued soon. DOE is currently planning to provide in April the initial report proposed in H.R. 3000 on projected AFR storage requirements and potential storage sites.

The proposed FY 1981 budget assumes that either borrowing authority or revenues from spent fuel charges will be available to cover the acquisition and operating expenses of storage facilities. The funds requested will provide for business activities, licensing and storage research and development. Prelicensing and conceptual design activities started in FY 1980 will continue in FY 1981 to permit prompt implementation of the program to meet near-term storage needs. A business office will establish and collect a charge for storage and disposal services, which will permit full recovery of the government's expenditures.

The principle that will be applied to financing the cost of nuclear waste management and disposal is that the cost should be paid by the generator of the waste and borne by the beneficiary of the activity generating the waste. Utilities will pay the cost of storage and disposal of waste from power plant operations and pass these costs on to their customers. The government will pay the cost of storage and disposal of wastes from defense and government R&D activities and finance it from tax revenues.

During FY 1981, research and development will continue to ensure the safe and efficient operation of storage facilities. Currently, fuel assemblies are stored in water basins both at reactors and away-from-reactors. Fuels of various types will be analyzed to identify their potential for fuel cladding failure. Fuel failure detection and fuel content and criticality monitors will be developed to facilitate operations. The storage of disassembled fuel underwater has the potential for greater storage capacities in the same space. Techniques for disassembling and storing fuel will be developed and demonstrated. Dry storage in caissons or shielded containers will also be further developed and demonstrated at the E-MAD facility at the Nevada Test Site. Analytical data on advanced storage techniques, like dry or disassembled fuel storage, will provide a basis for decisions on the use of

these technologies in meeting storage needs between 1985 and 1990. The program will also address transportation problems or shortfalls that could affect the availability of systems to transport spent fuel.

The international spent fuel program will support U.S. nonproliferation initiatives. The dissemination and exchange of technical information is beneficial to both the U.S. and foreign countries. The FY-1981 budget request includes funds for the conduct of feasibility and design studies related to expanding existing foreign storage facilities and establishing new foreign storage facilities which could serve one nation or a group of nations. The program would ensure that countries have the technical information necessary to store fuel so that premature reprocessing due to storage capacity limitations can be avoided.

A clear near term need exists for some AFR storage. If Congress provides DOE with the authority, we plan to provide a limited amount of storage capacity. As the program develops, additional capacity can be provided if necessary. This cautious approach represents sound management of the Nation's electrical generating capacity and is, at the same time, cost effective. We urge that Congress provide us with the authority and funding to permit us to support this vital part of the U.S. nuclear waste management effort.

DETAILED STATEMENT

Statement of
Ruth M. Davis
Assistant Secretary
Resource Applications
U. S. Department of Energy
Before the
Subcommittee on Energy and the Environment
Interior and Insular Affairs Committee
U. S. House of Representatives
Fiscal Year 1981 Authorization Hearings
February 25, 1980

I. Introduction

Mr. Chairman, I am pleased to discuss the Department of Energy's (DOE) Uranium Enrichment Activities and its Uranium Resource Assessment Programs.

My emphasis in this statement will be on the major functions of the program, actions of importance which have occurred in the last year, and on the current status and thrust of our uranium enrichment and resource assessment programs. As a newcomer of just over two months to this job, I am nevertheless aware of the previous statements you have heard and of your individual and collective expertise. I hope to be the recipient of it as a major input to our programs.

II. Major Functions of the Uranium Enrichment and Resource Assessment Activities

The major functions of these programs are:

(1) to supply all defense requirements for highly enriched uranium,

(2) to be the sole supplier of all needed enrichment services to domestic civilian nuclear reactors, i.e., primarily electric utility reactors,

(3) to be a principal supplier of enrichment services to non-U.S. (free world) utilities,

(4) to produce these services utilizing the most reliable, safe and cost-effective technologies available, and

(5) to develop and disseminate timely, comprehensive, and reliable information on the magnitude, availability, and economics of U.S. uranium resources and to participate in international efforts to evaluate foreign uranium resources.

Let me now address each of these functions briefly.

Since 1957 we have supplied all of the highly enriched uranium requirements for the naval nuclear propulsion fleet. These requirements represent about 10 percent of our current annual production. Although there has not been a new production requirement for the weapons program since 1964, if requirements were to increase in the future, they would have our highest priority.

We are the sole supplier of all enrichment services to domestic civilian reactor customers; we have been since 1957, when Shippingport started up as the first U.S. power reactor. Until recently, there has been no competition for the U.S. market. However, URENCO and EURODIF now have sales representatives in Washington seeking a share of the U.S. enrichment business. About 98 percent of the U.S. buyers are electric utilities, with the remaining 2 percent or less being used in research reactors.

To be an effective sole supplier of all enrichment services to domestic civilian reactor customers we need to (1) have credible estimates of future demands, recognizing that such estimates are difficult because this marketplace demand is highly influenced by factors outside the marketplace such as regulation and public policy; (2) produce slightly ahead of demand, believing the risk of slight oversupply to be less than undersupply, and (3) try to mitigate the periodic increases in enrichment service charges called separative work unit (SWU) charges by incorporating improved technology into our enrichment plants.

I shall deal with estimates of future demand later, as well as discuss production rates.

For many reasons we want to be a principal supplier of foreign enrichment needs, including:

(1) to exert the maximum influence on foreign users to cooperate in our nuclear non-proliferation objectives and obtain enriched uranium from the U.S. rather than developing an indigenous supply capability which could also be a source of weapons material;

(2) to obtain the benefits from this program in U.S. balance of payments; and

(3) to optimize the use of available capacity in order to minimize the cost for all customers.

Indeed, as you heard last year in statements on this same subject, the President stated in 1978, "The United States must restore confidence to the world in its ability and willingness to supply enriched uranium services for commercial applications." This presumes a real concern over the image of the U.S. as a seller in the international marketplace of enrichment services. Today we see the following non-U.S. suppliers in the international market along with their marketplace service capacity.

FOREIGN SELLERS OF URANIUM ENRICHMENT SERVICES AND THEIR ENRICHMENT CAPACITY

Supplier	Capacity (Millions of SWU/YR)
USSR	3 to 4 available for export now
URENCO	0.4 operating; 2.0 committed; 10.0 possible by 1990
EURODIF	2.2 operating; 10.8 committed, which should be operating by 1982
COREDIF	no current capacity; 10.0 possible by 1990
Japan	0.01 operating; 0.05 committed; 2.5 possible by 1990
Brazil	no current capacity; 0.2 possible by 1985

Internationally, the buyers from the U.S. are shown in Chart 1. The U.S. is experiencing a decline in its share of enrichment services for the world market. Some foreign customers have switched from DOE to EURODIF, URENCO, and the Soviet Union. Some new business is expected to go to the foreign suppliers rather than to the U.S. This concerns us. In order to reverse this trend we are visiting our foreign customers to demonstrate our desire to meet their enrichment requirements on more favorable terms than our competitors are offering.

To assure our domestic and foreign customers that the U.S. is the most economical and reliable source of enriched uranium we are working with all available technologies. Specifically, we have underway a major effort using gaseous diffusion technology and gas centrifuge technology, and DOE is financing R&D in Advanced Isotope Separation (AIS) Technology.

The Cascade Improvement Program (CIP) and the Cascade Uprating Program (CUP) are now the most economical means available in the U.S. to increase its uranium enrichment capacity. The CIP will do so by improving efficiency of the existing gaseous diffusion plants through incorporation of the latest gaseous diffusion technology. Capacity added by the CIP is obtained at a unit cost of only $17 per separative work unit (SWU) with no increase in operating costs. The CUP increases the capacity of the CIP improved plants by effectively utilizing additional electrical power. The capacity added from this program is obtained at a low cost of $54 per SWU, assuming a cost of 20 mills per kilowatt hour for power.

To further assure our domestic and foreign customers that the U.S. is the most economical and reliable source of enriched uranium, we are committed to completing the first 2.2 million SWUs of the Gas Centrifuge Enrichment Plant (GCEP) by 1988. This will permit GCEP to operate integrally with our gaseous diffusion plants, and moreover bring to the enriched uranium marketplace the prominent advantages of the centrifuge separation process, including: (1) operation using only 5 percent of the power of the diffusion

process; (2) adaptability to construction in increments consistent with market expansion; and (3) opportunity to develop and utilize second generation centrifuges with even more attractive economics when fully developed in the mid to late 1980s.

Besides, a major R&D effort is underway in Advanced Isotope Separation (AIS) Technology. One plasma separation and two laser methods are under evaluation in DOE's R&D program.

We want to continue our Uranium Resource Assessment Program in order to:

- assure adequate domestic uranium supplies for current and planned light water reactors.
- provide a measure of the light water reactor capacity supportable from domestic uranium supply over the long term.
- provide a basis for timely and economic decisions regarding the development and deployment of other energy technologies, such as reprocessing, recycle of uranium and plutonium, and advanced reactor designs.
- assure other countries of the adequacy of uranium supplies to avoid premature or unnecessary use of technologies that can lead to weapons proliferation.

These activities lead to an expanded U.S. resource position, a strong capability to meet our future needs for domestic supplies, and a sound technical basis for energy planning by government and industry.

The Uranium Resource Assessment Program has provided sound, well founded data since the days of the Atomic Energy Commission, which have been the basis for long-range nuclear planning by the government, and by utilities and uranium producing companies. Recently this information has had a key role in the Non-proliferation Alternative Systems Assessment Program (NASAP) and the International Nuclear Fuel Cycle Evaluation (INFCE).

We view resource assessment as a proper government activity, since it requires studies taking longer to complete than industry programs and it also involves resources not actively investigated by industry.

III. Important Actions of FY 1979 and FY 1980

A. Managerial

To strengthen the management of the uranium enrichment program we reorganized the Office of Uranium Resources and Enrichment. We established a Division of Business and Marketing Operations to more closely integrate budget, operational planning, pricing and marketing. This organizational change will provide comprehensive business support to manage uranium facilities, products, and transactions. By establishing a revolving fund

to finance enrichment operations, which DOE will propose to Congress in the near future, we will further enhance that support.

B. Technical Accomplishments

The major FY 1980 gaseous diffusion technical accomplishments involve the Cascade Improvement and Cascade Uprating Programs (CIP/CUP). The CIP/CUP is on schedule for completion at Oak Ridge and Paducah by the end of FY 1981.

Because of the recent 227-day strike at the Portsmouth plant, that portion of the CIP/CUP will be completed in FY 1983. By the end of FY 1980, 9.2 million SWU of the 10.1 million SWU capacity target for CIP/CUP will be installed. We foresee no technical problems in achieving the remainder of the capacity target.

Other technical support accomplishments associated with the operating, environmental and safety requirements of the operating facilities include the power recovery program, a major element of which is the demonstration project, scheduled to begin in FY 1980, to demonstrate the economic and technical feasibility of recovering waste heat from the plants. If successful, the power recovery program could reduce the diffusion plants' electric power requirements 2-6 percent (200-400 megawatts). The magnitude of the power recovery program will depend on the technical success of the FY 1980 demonstration project and the future cost of electric power.

The centrifuge development program is developing the base technology for transfer to the centrifuge and equipment manufacturers for use in the GCEP. From the centrifuge development program we have a centrifuge design which this year will be qualified for production. Extensive development and qualification tests are ongoing, and we are obtaining valuable operating experience and test data.

The GCEP project is on schedule--eight of the original 12 architect engineering firms have completed their designs. Eight major construction contracts have been completed and 10 others are underway. Eighteen offsite test and demonstration projects are being designed and built. Major procurement contracts have been placed for centrifuge machines, process equipment, electrical switchgear, transformers and some critical raw materials. About 2,400 people are now directly employed in designing and building this plant.

The initial section of the first process building, the early train, scheduled to be on-line in 1984, will provide the first operation of commercial mass-produced centrifuges. Its operation is essential to verify and qualify the manufacturing and assembly process before tens of thousands of centrifuges are required.

Production of separative work from the GCEP will begin in 1987, with a capacity of 2.2 million SWUs per year available by 1988. Additional production capacity will be added in 1.1 million SWU increments as demand for enrichment services indicates the need. For planning purposes, full production of 8.8 million SWUs per year is scheduled for 1993.

The GCEP facilities will include eight centrifuge process buildings with a 2.3 million square feet of floor area. Other facilities include the Recycle/Assembly Building, and other administrative, support, test, and service facilities as required. The electrical power consumption of the GCEP will be only 135 megawatts, about 5 percent of what an equal capacity gaseous diffusion plant would require.

For the GCEP facility on which design was begun in March 1978, all of the architect-engineers have been selected, and design is proceeding essentially on schedule.

The GCEP project, now in construction, has a construction manager/constructor onsite; site preparation is well along and foundations are being poured for the first process building. Several auxiliary buildings have been completed.

The AIS program achieved all of its technical goals during FY 1979, and progress on all three processes under development is continuing. Depending on the success of these development efforts, we will select two of the processes for further evaluation. Ultimately, we will select one process for scale-up to commercial production.

C. Production

In FY 1980 the three gaseous diffusion plants will operate at an average power level of 3,011 megawatt-years, and production will be 10.6 million SWU. However, the Tennessee Valley Authority (TVA) can expand its seasonal power reductions during FY 1980. If TVA elects to take to the full option, production for FY 1980 would be 10.2 million SWU.

D. Enrichment Supply and Changes in SWU Charge

Enrichment Supply

During FY 1979, 80 percent of DOE's long-term, fixed-commitment customers converted to the new Adjustable, Fixed-Commitment (AFC) contract, and DOE signed three new AFC contracts. As of January 1, 1980, DOE has a total contract commitment to supply 304 GWe of nuclear power of which about 200 GWe is with U.S. utilities and 104 GWe is with non-U.S. customers.

Enrichment Services Charges

Last year, the charge for uranium enrichment services increased 11.6 percent from $88.65 per SWU to $98.95 per SWU. This increase was not nearly as substantial as that in the cost of electricity required to operate our plants (24 percent) or in the cost of coal to our electric suppliers (17 percent). Moreover, we expect future increases in enrichment services charges will be less than increases in the price of coal or electricity.

E. Problems

Contract Terminations

Ten of our enrichment service customers (one domestic, nine non-U.S.) terminated their contracts with DOE in FY 1979, and additional contracts may be terminated this year because of reactor cancellations, licensing delays, desires for diversification of supply, needs to support national enrichment programs, and perceived uncertainty resulting from U.S. non-proliferation policies. We are encouraging customers who no longer need enrichment service contracts to assign their contract to other customers, if possible, rather than to terminate.

Portsmouth Strike

The local Oil, Chemical and Atomic Workers union at the Portsmouth gaseous diffusion plant struck from May 3, 1979 until December 16, 1979.

During the strike, company supervisors and managers ran the plant, thereby holding actual production loss from the strike to 500,000 SWU, or less than 4 percent of total production. The only significant impact of the strike will be a slip in the completion date of the Portsmouth plant CIP/CUP construction program from the end of 1981 to mid 1983. This schedule slip will not cause the project to exceed the total estimated cost of the project.

An issue raised by the union, outside of the normal collective bargaining negotiations, concerns health and safety issues at the plant. A DOE special panel, set up to investigate the union's allegations, has not identified any significant health and safety concerns at the Portsmouth plant. The panel will complete this investigation by the end of this month and will issue a final report.

F. Resource Data Collection and Evaluation

In FY 1979 we made substantial progress in the data gathering phases of the National Uranium Resource Evaluation (NURE) Program and in the transition to the quantitative evaluation of resources based on that data. At the same time, we modified our program strategy to assure first priority for quadrangles with the largest potential to increase our

resources. In addition, rather than using a uniform data gathering and evaluation approach, we are varying our activities as appropriate for the areas involved. We also started work on specific sites considered favorable for types of deposits found in other countries (World Class) and of intermediate grade to supplement the systematic quadrangle evaluation by focusing on specific sites with possible near term impact on the U.S. resource position.

Data gathering efforts in FY 1979 included flying 190,000 flight line miles of airborne radiometric surveys for 780,000 miles of the 1,100,000 planned. We have completed 240 quadrangles out of the 621 covering the entire U.S. We took 170,000 hydrogeochemical samples and completed work on 102 quadrangles. We did over 200,000 feet of drilling in FY 1979. We completed detailed evaluation of these data, as well as assessments in the first 18 quadrangles. Quadrangle evaluation and assessment will be an increasing part of the program; we will assess 98 quadrangles in FY 1980. We have issued over 900 reports on this program.

Besides the work on NURE, we made ore reserve estimates for about 1,000 of the 1,800 deposits on which industry provided data.

IV. FY 1981 Budget Request

A. Uranium Enrichment Activities Program

The DOE's FY 1981 budget for the Uranium Enrichment Activities Program is shown in Charts 2 and 3. Chart 2 breaks down the relative size of major program components. Chart 3 breaks down revenue sources to finance the major portion of the budget and our FY 1981 request. As Chart 3 shows, a significant portion of the fund requirements for the program are generated from revenues (approximately 94 percent); however, a net appropriation of $87,541,000, or 6 percent of the program requirements, is necessary in FY 1981.

The budget for the Uranium Enrichment Activities Program can be best described by looking at four major program activity categories shown on Chart 4: (1) Gaseous Diffusion Operations and Support; (2) Gas Centrifuge Operations and Support; (3) Program Direction; and (4) Revenues. The Gaseous Diffusion Operations and Support Activity includes funds required for ongoing operation of the gaseous diffusion plants at Oak Ridge, Tennessee; Paducah, Kentucky; and Portsmouth, Ohio, as well as funds required to assure these plants are well maintained both technically and physically. Funds are included for the purchase of cascade power, cascade operations, process and technical support, and necessary supporting services.

Gaseous Diffusion Operations and Support

Consistent with our production planning and operational constraints, DOE will operate the gaseous diffusion plants at their minimum power level of 2,660 megawatts in FY 1981 and produce 9.5 million separative

work units. At this power level, operational and safety margins are sufficient for cascade control. This action will result in buying less power from TVA and OVEC than required in the current contracts with them. At the budget power level, DOE would have to pay demand charges for power not purchased totaling $43,000,000 (TVA - $23,000,000; OVEC - $20,000,000). This $43,000,000 has been included in the budget. DOE is negotiating with the three power suppliers in order to reduce or eliminate the demand charge payments.

The current contract requirements for cascade power in FY 1980 are now estimated at $603,000,000 vis-a-vis an appropriation of $548,336,000. After we submitted our FY 1980 budget, (1) TVA raised power rates and (2) DOE received indications that TVA will not take all of its seasonal power reductions. Consequently, power deliveries will probably be higher than projected in the budget. In addition, OVEC has had unanticipated maintenance and pollution control financing requirements which will increase power costs in FY 1980.

The FY 1981 request for cascade power ($647,000,000) provides for a 22 percent increase in the unit cost of power over the current estimate for FY 1980, and reflects current information on the cost of power to be supplied by our three power suppliers during FY 1981. Without payment of contract demand charges for power not taken, the unit cost of power would be 12 percent above the FY 1980 estimate.

We request diffusion operating funds to cover the day-to-day operation and maintenance costs of the diffusion plants. Of the increase requested, about two-thirds will cover increased costs of wages, employee benefits, and materials. The rest will cover increased maintenance, and continue the 3-year program to reroof the diffusion plants.

Most process and technical support during FY 1981 will assure the long-term reliability and performance of the existing plants at the uprated capacity at minimum costs, mainly technical efforts to sustain long-term plant productivity by minimizing operating problems, adapting to changing conditions, and improving operations under such changing conditions. In addition, the existing plants must comply with all current and future environmental, health, safety and other policy or regulation changes. Dealing with such problems will be a significant part of our technical support. Technical support for the CIP/CUP program will help assure installation of the best possible equipment and technology during the rest of the capacity expansion programs.

Supporting services funds will allow us to continue various support activities essential to run the plants efficiently, such as: maintaining standby facilities; interplant flow of enriched uranium and other material; warehousing of uranium compounds; undertaking conceptual design and other engineering studies; and selling our services to both foreign and domestic customers.

Gas Centrifuge Operations and Support

Gas centrifuge operations include funds for development and demonstration, including running existing facilities, supporting construction projects to provide capability for testing and qualification of the GCEP centrifuge, and investigating the potential for improved centrifuge performance. The main thrust of the development program through FY 1981 is to provide qualified designs for the centrifuge and supporting components for the GCEP. With the startup of the Centrifuge Plant Demonstration Facility (CPDF) in 1982, the centrifuge development program is expected to peak. Then we will emphasize improving the centrifuge performance for incorporation in the later GCEP process building.

We have selected three manufacturers to provide centrifuges under initial GCEP procurement contracts; therefore, the industrial activities will shift from development emphasis to engineering and manufacturing in support of GCEP, and DOE will terminate its development technology transfer program.

Finally, our FY 1981 request includes funds for startup activities associated with GCEP, including conceptual design, special management, and miscellaneous studies by centrifuge program contractors, and the initial training of operation and maintenance personnel required to start up the first two GCEP process buildings.

Program Direction

The FY 1981 request also includes funds to cover salaries and related benefits of the DOE Headquarters and field personnel associated with the Uranium Enrichment Activities Program, including funds for 68 DOE staff-years--49 staff-years for necessary Headquarters program management and support, and 19 staff-years at the Oak Ridge Operations Office for guards required during shipment of enriched uranium.

Revenues

A major item is revenues, which includes the income which will accrue from enrichment services for domestic and non-U.S. customers. Our estimate is the net of advance payments by enrichment services customers in prior years. The estimate for FY 1980 provides for the sale of 10.8 million SWUs and is based on cost recovery pricing for all services performed. Also included in the estimate is approximately $110 million from the sale of depleted uranium to an Italian utility (ENEL).

Plant and Capital Equipment - Diffusion Operations

Turning to Chart 5, the first item, Environmental Protection and Safety Modification, Phase I, is the first in a series of annual projects to bring the gaseous diffusion plants into compliance with Federal, State and local pollution control requirements concerned with disposing of solid wastes and the discharge of certain liquid pollutants.

The second item, Instrumentation for Purge Cascades and Withdrawal Areas, provides vibration, temperature, and UF_6 detection data processing instrumentation similar to instrumentation to process equipment by the Cascade Uprating Program. Proper monitoring by computer and the use of trend analysis will provide operating information to prevent catastrophic failures of critical process and support equipment.

Supervisory Control and Data Acquisition systems, the next item, will monitor the critical parts of the high voltage switchyards and the power distribution networks. (The existing systems, incorporating technologies available at the time the plants were built (25 to 30 years ago), are inadequate to meet current and future power gradients and distribution needs.)

The fourth item, Utilities Upgrading, will improve the mechanical reliability and operational efficiency of some plant utility systems not improved in the Cascade Improvement Program (CIP) or Cascade Uprating Program (CUP). Many units and systems being upgraded are approaching 40 years of service. Therefore, they are no longer reliable, and are costly to maintain.

The fifth item, UF_6 Cylinders and Storage Yards, provides for new 14-ton cylinders, cylinder handling equipment and cylinder storage yards necessary to store depleted UF_6 generated by operating the gaseous diffusion plants in a safe and environmentally acceptable way.

The sixth item, General Plant Projects, is needed to maintain the enrichment facilities in good repair, to adapt the facilities for improved production techniques, to achieve economics of operations, and to reduce or eliminate health, fire, security, and other problems. We cannot accurately identify specific work this far in advance, because operating conditions in FY 1981 will determine what work we will need.

Chart 5 also shows the capital equipment funds requested for FY 1981 to replace equipment to support the ongoing operation of the diffusion plants and equipment needed for major centrifuge development efforts. DOE now has contracts to provide product from the gaseous diffusion plants extending through 2015. Meeting these commitments will require enough money for equipment to assure uninterrupted operation of the gaseous diffusion plants.

Prior year projects requiring FY 1981 appropriations, shown on Chart 6, include five projects authorized in FY 1980: (1) Motor and Switchgear Upgrading rewinds some of the smaller sized process motors and replaces some of the process and auxiliary switchgear that were not included in the CUP program; (2) Power Recovery Demonstration Cells provide facilities to demonstrate the feasibility of recovering a portion of the power (waste heat) used in the gaseous diffusion plants; (3) Plant Facilities Security Improvements provide improved security at the diffusion plants including essential outlaying facilities serving the plants; (4) Control of Water Pollution provides facilities to reduce the discharge of pollutants and to control accidental releases of potentially hazardous or polluting

materials into nearby streams; and (5) Control of Gaseous Effluents provides facilities at the Oak Ridge and Paducah plants to control the release of airborne effluents emanating from routine operations, primarily fluorides.

The final prior year item, Process Equipment Modifications, part of the Cascade Improvement Program started in FY 1971, will increase the capacity of the existing gaseous diffusion plants by about 5.5 million SWUs per year or about one-third (from 17.2 to about 22.7 million SWUs per year). The increase will come from incorporating the latest improvements in gaseous diffusion technology while not consuming additional power and with no increase in operating costs. The program, initially scheduled to be completed in FY 1981, will be completed during FY 1983 as the result of a 227-day strike at the Portsmouth plant.

Plant and Capital Equipment - Gas Centrifuge Operations

Chart 7 shows the plant and capital equipment funds requested in the FY 1981 budget for Gas Centrifuge Operations and Support.

The Enriched Uranium Production Facilities Project is to build the Gas Centrifuge Enrichment Plant (GCEP) at the DOE Portsmouth Plant site near Piketon, Ohio, to provide needed additional enrichment capacity. When completed, it will include eight process buildings, a recycle/assembly building and several plant support facilities.

The FY 1981 funds will permit continuing activities, started in prior years, including: design, expansion of vendor capacity, technical support, procurement of centrifuge machines and service modules, materials, and other GCEP components. Funds are provided to continue to build Process Building No. 1, the Recycle/Assembly Building, and centrifuge manufacturing facilities. We estimate this project will cost $5.5 billion in FY 1981 dollars.

B. Uranium Resource Assessment Program

Our budget request for the Uranium Resource Assessment Program is shown in Chart 8. The FY 1981 requested budget authority of $35.8 million is a decrease of $28.9 million from the FY 1980 appropriations, and reflects a somewhat lessened urgency regarding the completion of a comprehensive study of U.S. uranium resources. Reduced demand projections, and an improving resource situation can allow the deferral of decisions for large-scale commitment to advanced nuclear systems. The National Airborne Radiometric Reconnaissance Survey will be completed as planned during FY 1981, and the survey results will be open filed in FY 1982. The conduct of a systematic National Hydrogeochemical and Stream Sediment Survey will be discontinued. Future sampling will be done selectively in field sites for which geochemical data are determined to be specifically needed in order to maintain an acceptable level of geologic data upon which to base resource estimates. This approach necessitates the closeout

of two of the three DOE national laboratories currently engaged in the hydrogeochemical survey. Analysis of samples collected to date will continue at one laboratory and those data will be integrated into quadrangle evaluations. In addition, subsurface investigations will be reduced. Although this is a departure from the previously planned program which provided a more comprehensive data base for the entire country, it is believed that the reliability of uranium resource estimates will not be excessively impacted as a result of reduced data collection activities. The pace of the program will be slowed and completion of the national assessment will be delayed 3 to 5 years beyond the 1985 date in the FY 1980 Congressional Budget submission.

V. Technical Aspects of the Program

A. Uranium Enrichment Activities Program

Operational Planning for the DOE Enrichment Plants

A synopsis of DOE's long-range operating plan for enrichment plants is presented below.

DOE Projection of Nuclear Power Growth

The DOE Office of Uranium Resources and Enrichment (OURE) has updated its estimates of nuclear power capacity served by U.S. uranium enrichment plants. Chart 9 summarizes the current mid-range estimate. OURE estimates that 161 gigawatts of U.S. and non-U.S. nuclear power capacity with DOE enrichment services contracts will be on-line by the end of 1985. We expect on-line nuclear power capacity with DOE enrichment services contracts to increase to 227 gigawatts by 1990 and to 294 gigawatts by 1995. These estimates are 19 gigawatts lower in 1985 and 58 gigawatts lower in 1990 than presented in last year's testimony and reflect repercussions of the Three Mile Island 2 incident, announced delays and cessation of nuclear construction activities by some domestic utilities, and enrichment service contract terminations by some non-U.S. customers.

The estimate for domestic nuclear power capacity on-line through 1990 reflects a detailed examination of each reactor now in the "pipeline." The 1995 domestic estimate reflects an October 1979 mid-range projection of the Energy Information Administration (EIA) in a re-evaluation of the nuclear forecasts published in its 1979 annual report. The non-U.S. estimates were developed analogously to the domestic estimates. Each non-U.S. reactor with a DOE enrichment contract was examined in detail. Also, we made a country-by-country evaluation of formal nuclear plans through 1995 and an assessment of the likelihood of achieving these plans and the potential for the U.S. to obtain an enrichment contract.

The above estimates reflect our best guesses. Although there is a sound basis for these estimates, there is considerable uncertainty about the future, particularly about the impact of future Nuclear Regulatory

Commission licensing policies, possible impact of international events (such as the loss of Iranian oil), and impact of United States non-proliferation policies, etc. We will continue to monitor these events and revise our projections accordingly.

Requirements for DOE Enrichment Services

The enrichment services requirements corresponding to the nuclear power growth are shown in Chart 10. We projected enrichment services requirements based on the above nuclear power growth using standardized boiling water and pressurized water once through cycle reactor models. These models reflect annual refueling schedules, as well as 18-month refueling schedules (which have higher SWU requirements). The latter was included because a significant fraction of our customers say they plan to operate with longer refueling schedules.

Besides nuclear power reactor requirements, Chart 10 includes U.S. Government needs, which through 1995, are expected to average 1 million SWU per year. Government users now include the Naval Reactors program, and the nuclear R&D programs.

Actions Based on the DOE Projection for Enrichment Services

The projected DOE enrichment services supply is also shown on Chart 10. Based on the DOE enrichment services projections, we have developed an operating plan to meet requirements, seeking to supply the projected requirements for enrichment services, at a transaction tails assay no greater than 0.25% U-235, while minimizing DOE-owned inventories of low enriched uranium.

It appears that we can operate the enrichment plants at the current 0.20% U-235 tails assay until about the early 1990s. We also do not expect to have to increase the transaction tails assay above the current 0.20% U-235 level through 1995 thereby allowing customers to obtain nuclear fuel at close to minimum cost.

The low enriched uranium inventory levels as a function of time for the current operating plan are shown in Chart 11, which shows the separative work contained in DOE's inventory of low enriched uranium. As indicated, we will meet all projected requirements and maintain an inventory of at least 14 million SWUs throughout the period.

The minimum level is comprised of:

(1) A 9 million SWU working inventory to serve as a buffer between the levelized daily production of enriched uranium and the intermittent day-to-day shipments of finished product to enrichment services customers.

(2) A 5 million SWU set aside for possible use as part of U.S. efforts to improve international nuclear fuel assurances as described in the President's response to Section 104(b) of the Nuclear Non-proliferation Act of 1978.

In producing the inventory shown on Chart 11, we have assumed (except for FY 1981) that the full 8.8 million SWU GCEP capacity will be completed in 1993, and that actual electric power delivered to the gaseous diffusion plants will be only 96 percent of the planned levels. This is based on nine years of historical data and reflects reductions in contracted power deliveries in emergencies to help alleviate threatened power shortages to consumers, coal shortages at the DOE power suppliers, generator outages due to storms, etc. We have also assumed further power reductions from FY 1982-1986 in order to better balance supply of enriched uranium with forecast demand.

Sale of Depleted Uranium to Italy

DOE has contracted to sell 20,000 metric tons of 0.3% U-235 depleted uranium to the Italian electric utility, Ente Nazionale per l'Energia Ellecttrica (ENEL) for $162 million in total sales. The material will be delivered in FY 1981 and 1982 to EURODIF, the gaseous diffusion plant in Tricastin, France. Italy's nuclear power program has been delayed considerably, and ENEL will have the uranium enriched under their EURODIF contract to make it available for subsequent use.

The quantity of material in this sale represents only a small fraction of DOE's expected depleted uranium inventories through this period.

Marketing Activities

A goal of U.S. energy policy is for the U.S. to "restore confidence in its ability and willingness to supply enriched uranium services." For the United States to maintain its position as a major supplier to the non-U.S. market and as the sole supplier for the U.S. enrichment market, we must run existing enrichment facilities efficiently, undertake a timely expansion of DOE enrichment facilities, and at the same time, actively contract and market if we are to compete with the European suppliers for international customers. To accomplish this we are:

- maintaining an enrichment contracting posture which reflects customer needs, U.S. policy and current market conditions;
- promoting our service by informing existing and potential customers of DOE enrichment policies, contract terms, etc.;
- using regional foreign and domestic missions and conferences to explain DOE's contract arrangements, present capacity and expansion plans, as well as to assess potential market opportunities, prevent the loss of existing customers and establish meaningful contacts; and
- analyzing market forces, customer needs and supply/demand conditions.

With a strong contracting and marketing effort, the U.S. will continue to benefit from the uranium enrichment program in terms of balance of payments, domestic employment and significant influence on nuclear policies abroad.

During the past year our marketing staff has had many contacts with enrichment customers, both at home and abroad. DOE teams went on marketing missions in Mexico, Turkey, Egypt, Greece, Japan, Korea and Taiwan. Also, in February 1980, we will hold enrichment seminars with U.S. utilities in five cities from Boston to San Francisco to improve personal contacts and exchange business information.

In July 1974, because the expected capacity of the three gaseous diffusion plants was committed, the U.S. stopped contracting for enrichment services. On May 26, 1978, Secretary Schlesinger announced that DOE was ready to accept new orders for enrichment services with domestic and non-U.S. customers. This announcement followed congressional hearings and congressional approval of a revision to the Uranium Enrichment Services Criteria recognizing that DOE enrichment capacity would be expanded by building the 8.8 million SWUs per year Gas Centrifuge Enrichment Plant at Portsmouth, Ohio. By re-entering the enrichment services market, the U.S. has enhanced the credibility of its fuel assurances to those nations abiding by appropriate non-proliferation obligations.

The new Adjustable, Fixed-Commitment (AFC) contract for uranium enrichment services made available in July 1978, has been well received. About 80 percent of the customers who previously held the Long-Term, Fixed Commitment contract have converted to the AFC contract. We now have 174 AFC contracts, including three new ones. The AFC contracts cover the fuel requirements for about 170 million kilowatts of nuclear generating plant capacity. The total of all types of DOE contracts covers about 305 million kilowatts of nuclear power. Also during FY 1979 we had 10 customers terminate their enrichment contracts because of cancellation of their reactor projects, desire to support a European enrichment supplier for nationalistic reasons or for diversification of supply, and a feeling of uncertainty and lack of assurance about being granted a license to export enriched uranium under the terms of the Nuclear Non-proliferation Act of 1978.

The Adjustable, Fixed-Commitment contract has already accomplished one of its main objectives: it has allowed customers to reschedule firm deliveries to a later date, in line with actual needs. Before the AFC contracts were signed last year, there were 72.3 million separative work units (SWUs) scheduled for delivery to fixed-commitment customers from FY 1980 through FY 1984. After the AFC conversions and schedule adjustments, only 40.7 million SWUs remained and 31.6 million SWUs were delayed beyond FY 1984. A number of utilities are pooling SWUs in order to match purchases with real demand. The AFC contract permits the customer to use surplus SWUs delivered under another DOE contract instead of ordering "new" SWUs under his own AFC contract. Thus, the AFC contract seems to be working.

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B. Uranium Resource Assessment Program

National Uranium Resource Evaluation

The National Uranium Resource Evaluation (NURE), a phased program of data gathering and evaluation, begun in 1974, will be completed in the late 1980s. NURE seeks to develop basic information to show favorable geologic areas for the occurrence of uranium deposits. These data provide the basis for estimating contained resources, by analogy to environments where known deposits have been studied in detail. Although the program so far has been heavily oriented toward data gathering, a significant part of the U.S. will also have been evaluated and resource estimates made by the end of FY 1980.

Since NURE is a complex and widespread program, it involves numerous organizations and individuals with a variety of expertise. Our principal contractor is the Bendix Field Engineering Corporation. The United States Geological Survey is involved in this assessment and participates in a number of other activities. Also, State geological surveys, universities and private firms are involved.

The NURE program is planned, carried out and reported on the basis of the National Topographic Map System Quadrangles, which divides the nation into some 621 quadrangles which, in the conterminous U.S. are 1° of latitude by 2° of longitude and average about 5,700 square miles in area.

NURE's data gathering has concentrated on a systematic nationwide airborne radiometric reconnaissance survey and a similar hydrogeochemical and stream sediment reconnaissance survey. It also includes surface and subsurface geologic investigations. The data from the various surveys and investigations are studied, supplemented by additional field studies as warranted, and evaluated to identify areas favorable for uranium deposits. A detailed comparison is made of the geologic features of these areas to areas with known types of uranium deposits. The survey results and the study are published as a folio for each quadrangle, which is the basis for quantitative assessments of the resources of each favorable geologic areas.

The data gathering is well underway--generating a substantial data base which we are now evaluating. Future efforts will increasingly involve evaluation; hence, more quantitative assessment results will be available. It is important for us to keep a high level of activity so that we can use these data. Accomplishments through FY 1979 included:

- Completing over 780,000 of the planned 1,100,000 flight line miles to be covered by the national aerial radiometric reconnaissance survey,

- Collecting stream and sediment samples covering over 1,900,000 square miles,
- Completing over 212,000 feet of drilling and approximately 300,000 feet of logging of industry non-uranium drilled holes,
- Developing and transferring to industry a direct uranium borehole logging system,
- Placing an estimated 950 reports on open file, including 90 radiometric surveys, and 207 hydrogeochemical surveys.

Program segment accomplishments through 1979 and plans for 1980 and 1981 are shown in Chart 12. The program plan for 1981 will complete the flying phase of the airborne radiometric reconnaissance survey; the results of which will be open filed in FY 1982. The status of the radiometric survey is shown in Charts 13 and 14.

The concept of a national hydrogeochemical survey will be dropped and future sampling done on field sites for which geochemical data are determined to be specifically needed. However, the national geochemical survey work completed through 1981 will have covered approximately one-half of the U.S. and will provide data for most of the higher priority areas. Charts 15 and 16 illustrate the status of the hydrogeochemical survey. It will be noted that a large part of the country has been sampled.

The quadrangle completion work for the various areas are shown in Charts 17 and 18. By the end of FY 1980, 116 top priority quadrangles will have been evaluated. In FY 1981, 30 additional quadrangle assessments will be completed. By the end of FY 1983, about 200 priority quadrangles will have been evaluated. The comprehensive assessment of the United States, covering the balance of the quadrangles, will be completed in the late 1980s.

While quantitative results from the systematic quadrangle assessments are limited, results so far suggest that the program will result in increases to our estimates of uranium resources. The more complete and comprehensive approach to development of basic field data and the detailed comparison of geology to known uranium deposits, of all types, tend to expand known favorable areas and also to identify entirely new favorable areas.

<u>World Class Deposits</u>

Besides the systematic quadrangle evaluation program, we are studying specific areas considered favorable for the occurrence of deposits similar to those found in other countries (World Class deposits). In the U.S. most of the currently identified resources are in sandstone type deposits. These are located primarily in the Colorado Plateau area of Colorado, Utah, New Mexico, and Arizona; the sedimentary basins in

Wyoming, and the Texas coastal plain. However, deposits in other countries have primarily been in non-sandstone geologic environments. Past exploration in the U.S. has not investigated similar geologic environments in any detail. In World Class deposit studies many areas and types of deposits will be investigated and promising sites will be studied in detail. Detailed studies, including drilling, on two specific sites will be completed by the end of FY 1980. Detailed study on four additional sites will be initiated in FY 1981.

Intermediate Grade Deposits

We are also investigating areas of known intermediate grade deposits, generally 0.01 to 0.05% U_3O_8, which have been below the grades of primary economic interest to the mining industry but which are relevant to nuclear power planning decisions. Most of such resources are expected to be producible at costs less than $100 per pound of U_3O_8.

Intermediate grade studies have identified over 50 candidate areas for studies. Detailed studies will be completed at three sites in FY 1980 and investigations begun at three other sites in FY 1981.

Subsurface Investigations

Subsurface investigations have involved drilling and logging to confirm estimates of resources, and to develop information on geologic conditions at depth for defining the nature and extent of favorable areas. Drilling also investigates World Class and intermediate grade sites.

Subsurface investigations, to be modified in FY 1981, will sharply reduce the amount of drilling. Logging of industry drilling, including non-uranium exploration holes, will be continued, but at lower levels.

International Activities

To expand the quantities and geographic distribution of the identified world uranium resources, DOE participates in the International Uranium Resource Evaluation Project (IUREP) and cooperative uranium exploration R&D projects sponsored by the Nuclear Energy Agency and the International Atomic Energy Agency. IUREP has identified 40 priority countries where the possibility for discovery of uranium resources is good but where exploration and appraisals have been inadequate. Field investigations are underway and will continue in those priority countries into FY 1981. A number of cooperative research and development studies underway will improve the technology for identification and evaluation of uranium areas.

U.S. Uranium Position

DOE's current estimates of U.S. uranium resources are shown in Chart 19. These estimates reflect input from the NURE Program; but, as previously noted, so far the NURE Program has reassessed only limited

areas. The estimates are, therefore, an indication of our current knowledge and will change as work continues.

Ore reserves are contained in deposits delineated in detail, primarily by industry drilling. Those reserves producible at costs up to $50 per pound of U_3O_8, are estimated at 920,000 short tons U_3O_8. At $30 costs, which is closer to the level of economic interest at today's prices (in the low $40s), reserves are 690,000 short tons U_3O_8. The DOE cost categories account for all costs required to find and produce the uranium at the time the estimate is made and, as such, they do not represent the prices at which the uranium might be available in the marketplace.

Resources not meeting the stringent requirements of detailed deposit drilling needed to establish reserves are defined as potential resources. DOE classifies potential resources into three categories: probable, possible, and speculative. The probable potential resources are those contained in extensions to known deposits and within delineated mineral trends, principally within the well-established uranium districts. Possible potential resources are contained in "productive" formations within "productive" uranium provinces, but outside the established mineral trends. "Productive" is arbitrarily defined as having resources or past production totaling 10 tons U_3O_8. Speculative potential resources are estimated for identified favorable areas within geologic formations or provinces that have not previously been "productive." Resource estimates presented here are unchanged from levels reported in 1979. Revised national estimates of uranium resources at $30 and $50 per pound of U_3O_8 and initial estimates of resources at $50 to $100 per pound of U_3O_8 will be available in October 1980, when a major report on the findings of the National uranium resource assessment will be issued.

Through the NURE Program, reserves and resources estimated at forward costs up to $50 per pound of U_3O_8 are identified by their land status. Of the 920,000 short tons of reserves estimated as of January 1, 1979, 50.6 percent occur on lands in the public domain and 11.4 percent occur on Indian lands. Of the total estimated quantity of reserves and resources (4.1 million tons U_3O_8), 46 percent occur on lands in the public domain and 11 percent occur on Indian lands. Certain lands in the public domain have been and are currently under review for their wilderness potential. DOE has become actively involved in monitoring the progress of and making recommendations based on identified resource potential to the responsible Federal agencies regarding the management of their public lands. DOE was particularly successful in keeping certain tracts of relatively high uranium resource potential from being withdrawn during the Forest Service's RARE II study. The Bureau of Land Management is just getting underway in their effort to assess the wilderness potential of their public lands. It is possible that substantial areas containing estimated reserves may be dropped from their potential wilderness area inventory by virtue of the current extent of mining activities; nevertheless, DOE is working closely with BLM to assure consideration of resource potential in their management plans.

In late 1979, the National Research Council's Committee on Nuclear and Alternative Energy Systems (CONAES) issued a report which addressed the role of nuclear energy in the United States. CONAES concluded that DOE's estimates of reserves and probable potential resources at forward costs up to $50 per pound of U_3O_8 of "about 2.4 million tons" are reliable enough to plan on. CONAES also noted that if the additional resources estimated by DOE as possible and speculative were included, the estimate would rise to about 4 million tons. Thus, there is no basic disagreement between CONAES and DOE on uranium resources since CONAES, in effect, has accepted DOE estimates. In their report CONAES concluded that "a more complete assessment is needed of domestic and world uranium resources, and of the rate at which they can be produced at various costs." We agree with that conclusion.

While estimates of the magnitude, location, and economics of the resource base are important to understanding future availability, it is also necessary to evaluate the discoverability and producibility of these resources. A key factor is the quantity of uranium that can actually be produced annually in the future, which depends on the level of exploration and ore discovery rate, as well as the production expansion capability of industry. Detailed DOE studies of ore reserves and probable potential indicate that the capability for industry to expand production from the current annual rate of around 18,500 tons U_3O_8 per year to a level in the early 1990s of around 60,000 tons from $30 resources does exist. This level could be further expanded by 15,000 tons if $30 to $50 resources were produced. An analysis of production capability from $30 to $50 resources done in late 1979 shows this level could be further expanded by 15,000 tons.

These attainable levels would provide the basis for expanded U. S. light water reactor capacity. The 60,000 tons of U_3O_8 could fuel some 300,000 megawatts of light water reactor capacity assuming 0.20% U-235 enrichment tails and no recycle of uranium or plutonium. Such production levels are attainable, but should be considered as upper limits which would require a diligent effort by industry in exploration, development of new mines, and construction of ore processing plants.

Industry Activities

The domestic uranium industry has been very vigorous in responding to growing uranium demands and increasing prices. Exploration, development, and production have increased in recent years. However, concern about the reduced projections of future uranium demand, softening uranium prices, lack of new procurement contracting and expanding low cost foreign resources, coupled with the increased regulatory difficulties for exploration and uranium milling have caused a cutback in industry activity.

In 1978 industry spent over $300 million for exploration, and drilled 48 million feet of holes; in 1979 industry drilled about 38 million feet or about 20 percent less that in 1978. This is 28 percent below the 53

million feet planned by the industry at the beginning of 1979. A similar pattern appears in mining and milling plant construction. The $427 million of capital funds expended in 1978 for new mines and mills were well below the $634 million that was planned for 1978 and below the $492 million spent in 1977. Planned expenditures for 1979 and 1980 were also reduced from a year earlier. While we expect the current level of industry activity will provide adequate uranium for the next several years, these observed reductions in exploration and production plant development may indicate a trend that could lead to future domestic supply difficulties and should be monitored closely.

Actual uranium production in the U. S. in 1979 was some 18,500 tons of U_3O_8 which was above actual 1979 requirements of around 16,000 tons U_3O_8. As shown in Chart 20, the uranium needed to fuel planned reactors is projected to grow to levels of around 25,000 tons in 1985, based on 114 GWe and 35,000 tons in 1990, based on 152 GWe of nuclear generating capacity. Total domestic supply consists of purchase commitments and additional material available for sale by domestic producers. This projected supply would be adequate to meet needs until the mid 1980s, but additional facilities must be constructed to cover the needs of later years.

Chart 20 also shows that projected uranium requirements for the mid-1980s and later are only partially covered by existing procurement contracts. Thus, utilities will have to buy substantial amounts of uranium to meet their future needs. The way in which utilities buy this additional uranium will influence U.S. producers' willingness to undertake additional development projects.

So far, foreign uranium has played only a minor role in meeting U.S. needs, because U.S. utilities have preferred to buy U.S. uranium. Given the size of the U.S. resource base and the fact that the producing industry is well developed, the U.S. should be able to meet its uranium needs in the future. However, U.S. producers might have to compete with generally lower-cost foreign producers for the U.S. market.

Uranium prices for new uranium contracts have been in the low $40 range for the last 3 years. Considering inflation, this has resulted in reduction of the real price. In addition, recently there has been reduction in nominal prices as well. This softening in prices reflects a more comfortable near-term supply-demand position, and increased optimism about adequacy of future supply. The reduction in uranium prices is causing some reassessment of exploration and production plans by producers, particularly those with higher cost resources. The important question is whether prices will stabilize at levels adequately reimbursing production costs and providing sufficient incentive for continued vigorous exploration. Or will prices drop too far, for too long--leading to future supply problems. We will continue to monitor this situation closely.

VI. Present Health of Program

As concluding comments let me assess the health of the programs.

Overall program activities are proceeding smoothly and on schedule. While our production planning aims to balance supply and demand, we have adequate flexibility to respond to increased military and civilian needs. Within the short-term, production of low enriched uranium will slightly exceed demand. I do not believe this is cause for concern; it may enhance our reliability as a world supplier.

Recognizing that the demand for enrichment services is highly uncertain, we are increasing our efforts to monitor and evaluate the market environment, and to pursue the most cost-effective production mode possible. Gas centrifuge development continues to be highly successful and independent industry experts have endorsed it. I am confident that this technology will be fully demonstrated and ready for incorporation into the Gas Centrifuge Enrichment Plant at Portsmouth.

The gaseous diffusion complex continues to perform with greater than 99 percent on-stream reliability, and despite a prolonged strike at Portsmouth, production during the last year was within 96 percent of our target. Whereas the diffusion complex will continue to be the major portion of our enrichment capability, rising costs of electricity for the plants may require replacing some of this capacity with more energy efficient processes such as gas centrifuge or, in the longer term, advanced isotope separation methods. We are watching this situation closely, and will recommend appropriate action to the Congress when and if replacement is warranted.

I believe our contracting posture is now quite good. The terms and conditions under which we offer enrichment services are the most favorable in the world. This does not mean, however, that we can relax our efforts to market our services aggressively, or be responsive to customers' needs. We still need to do considerable work to restore and maintain our position as a reliable supplier of enrichment services. I believe we have come a long way towards this goal to date, and we are in a strong position to face the challenges ahead.

This concludes my statement, Mr. Chairman and Members of the Committee. I would be happy at this time to answer any questions.

CHART 1

BUYERS OF DOE ENRICHMENT SERVICES

COUNTRY	NO. OF REACTORS	SWU	%	COUNTRY	NO. OF REACTORS	SWU	%
AUSTRIA	1	0.7	<1	S. AFRICA	2	1.3	<1
BELGIUM	3	1.7		S. KOREA	8	8.5	2
BRAZIL	1	0.8		SPAIN	9	8.9	2
EGYPT	1	0.8		SWEDEN	11	9.4	2
FRANCE	3	2.2		SWITZERLAND	6	4.0	1
INDIA	2	0.4		TAIWAN	6	4.0	2
ITALY	3	1.4		THAILAND	1	0.8	<1
JAPAN	50	49.0	16	UNITED STATES	206	199.8	66
MEXICO	2	1.3	<1	W. GERMANY	15	10.9	4
NETHERLANDS	2	1.1		YUGOSLAVIA	1	0.8	<1
PHILIPPINES	1	0.8		TOTALS	342	304.3	

CHART 2

URANIUM ENRICHMENT PROGRAM

FY 81 BUDGET BREAKDOWN

TOTAL BUDGET: $1,377 M

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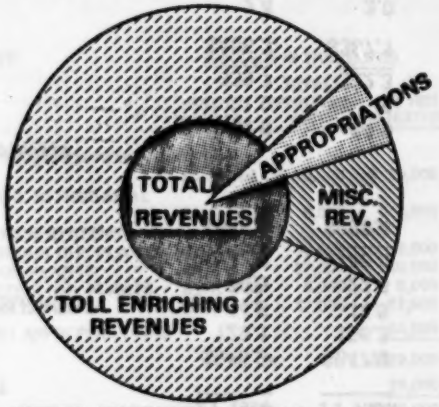
CHART 3

URANIUM ENRICHMENT PROGRAM

FY 81 REVENUE BREAKDOWN



TOTAL AVAILABLE FUNDS: $1,377 M

CHART 4

FY 1981 CONGRESSIONAL BUDGET REQUEST
URANIUM ENRICHMENT ACTIVITIES

	BUDGET AUTHORITY (DOLLARS IN MILLIONS)	
	FY 1980	FY 1981
GASEOUS DIFFUSION OPERATIONS & SUPPORT		
CASCADE POWER	$548.3*	$647.0
DIFFUSION OPERATIONS	129.1	156.3
PROCESS & LONG-TERM TECHNICAL SUPPORT	14.5	14.5
SUPPORTING SERVICES	20.5	22.6
PLANT & CAPITAL EQUIPMENT	132.9	146.0
TOTAL GASEOUS DIFFUSION	$845.3	$986.4
GAS CENTRIFUGE OPERATIONS & SUPPORT		
GAS CENTRIFUGE PROCESS DEVELOPMENT & DEMONSTRATION	64.6	64.0
ALL OTHER OPERATING	1.0	.8
PLANT & CAPITAL EQUIPMENT	339.7	322.3
TOTAL GAS CENTRIFUGE	$405.3	$387.1
PROGRAM DIRECTION	2.4	3.0
REVENUES	-1,310.0**	-1,289.0
TOTAL	$-57.0	$ 87.5

*Excludes pending supplemental request of $54,600,000 for increased power costs.
**Excludes pending supplemental request decreasing revenue estimates by $253,000,000.

CHART 5

FY 1981 CONGRESSIONAL BUDGET REQUEST
URANIUM ENRICHMENT ACTIVITIES

GASEOUS DIFFUSION - PLANT & CAPITAL EQUIPMENT (DOLLARS IN THOUSANDS)

	PROJECT NUMBER	TOTAL ESTIMATED COST	FY 1981 OBLIGATIONS
PLANT			
ENVIRONMENTAL PROTECTION & SAFETY MODIFICATIONS, PHASE I GASEOUS DIFFUSION PLANTS	81-R-506	$ 55,000	$ 10,000
INSTRUMENTATION FOR PURGE CASCADES & WITHDRAWAL AREAS, GASEOUS DIFFUSION PLANTS	81-R-505	6,000	6,000
SUPERVISORY CONTROL & DATA ACQUISITION SYSTEMS, PADUCAH, KY. & PORTSMOUTH, OH. GASEOUS DIF. PLANTS	81-R-504	13,000	6,000
UTILITIES UPGRADING, GASEOUS DIFFUSION PLANTS	81-R-503	27,000	10,000
UF_6 CYLINDERS & STORAGE YARDS, GASEOUS DIF. PLANTS	81-R-502	8,000	8,000
GENERAL PLANT PROJECTS, VARIOUS LOCATIONS	81-R-501	17,500	17,500
PRIOR YEAR PROJECTS REQUIRING FY 1981 APPROPRIATIONS			64,500
SUBTOTAL PLANT			$122,000
CAPITAL EQUIPMENT			24,000
TOTAL GASEOUS DIFFUSION -PLANT & CAPITAL EQUIPMENT			$146,000

CHART 6

PRIOR YEAR PROJECTS REQUIRING FY 1981 APPROPRIATIONS

GASEOUS DIFFUSION - PLANT & CAPITAL EQUIPMENT

(DOLLARS IN THOUSANDS)

	PROJECT NUMBER	TOTAL ESTIMATED COST	FY 1981
MOTOR & SWITCHGEAR UPGRADING, GASEOUS DIF. PLANTS	80-UE-5	$ 28,500	$12,000
POWER RECOVERY DEMONSTRATION CELLS, GASEOUS DIF. PLT.	80-UE-4	11,000	7,000
PLANT FACILITIES SECURITY IMPROVEMENTS, GASEOUS DIFFUSION PLANTS	80-UE-3	17,000	12,500
CONTROL OF WATER POLLUTION, GASEOUS DIF. PLANTS	80-UE-2	17,000	9,500
CONTROL OF GASEOUS EFFLUENTS, OAK RIDGE, TN. & PADUCAH, KY. GASEOUS DIFFUSION PLANTS	80-UE-1	7,000	3,500
PROCESS EQUIPMENT MODIFICATIONS, GASEOUS DIF. PLANTS	71-1-F	990,000	20,000
			$64,500

CHART 7

FY 1981 CONGRESSIONAL BUDGET REQUEST
URANIUM ENRICHMENT ACTIVITIES

GAS CENTRIFUGE - PLANT & CAPITAL EQUIPMENT (DOLLARS IN THOUSANDS)

	PROJECT NUMBER	TOTAL ESTIMATED COST	FY 1981 OBLIGATIONS
PLANT			
ENRICHED URANIUM PRODUCTION FACILITIES, PORTSMOUTH, OH. (GAS CENTRIFUGE ENRICHMENT PLANT)	76-8-g	$1,121,630*	$319,000
CAPITAL EQUIPMENT			3,300
TOTAL GAS CENTRIFUGE - PLANT & CAPITAL EQUIPMENT			$322,300

*Authorization requested to date. Total line item project cost is currently estimated at $5,500,000,000 in FY 1981 dollars, assuming project completion in FY 1993.

CHART 8

FY 1981 CONGRESSIONAL BUDGET REQUEST
URANIUM RESOURCE ASSESSMENT

	BUDGET AUTHORITY (DOLLARS IN MILLIONS)		
	FY 1980	FY 1981 REQUEST	CHANGE
OPERATING EXPENSES			
GEOLOGIC & RELATED INVESTIGATIONS	$ 47.7	$21.6	$-26.1
SURFACE GEOLOGIC & RELATED INVESTIGATIONS	19.9	12.2	-7.7
AERIAL SURVEYS	8.6	4.7	-3.9
HYDROGEOCHEMICAL SURVEYS	9.8	3.7	-6.1
SUBSURFACE GEOLOGIC INVESTIGATIONS	9.4	1.0	-8.4
TECHNOLOGY APPLICATIONS	3.9	3.8	- .1
SUPPORTING SERVICES	4.3	4.0	- .3
INTERNATIONAL ACTIVITIES	.5	.5	0
PROGRAM DIRECTION	4.3	4.6	+ .3
TOTAL OPERATING EXPENSES	$ 60.7	$34.5	$-26.2
CAPITAL EQUIPMENT	2.5	.5	-2.0
PLANT	1.5	.8	- .7
TOTAL URANIUM RESOURCE ASSESSMENT	$ 64.7	$35.8	$-28.9

CHART 9

CIVILIAN NUCLEAR POWER DEMAND

(1/80 DOE FORECAST)

END OF YEAR	GIGAWATTS ELECTRIC		
	U.S.	NON-U.S.*	TOTAL
80	56	35	91
85	107	54	161
90	147	80	227
95	179	115	294

*SUPPORTED BY DOE ENRICHMENT CAPACITY

CHART 10

ANNUAL SEPARATIVE WORK SUPPLY AND DEMAND*

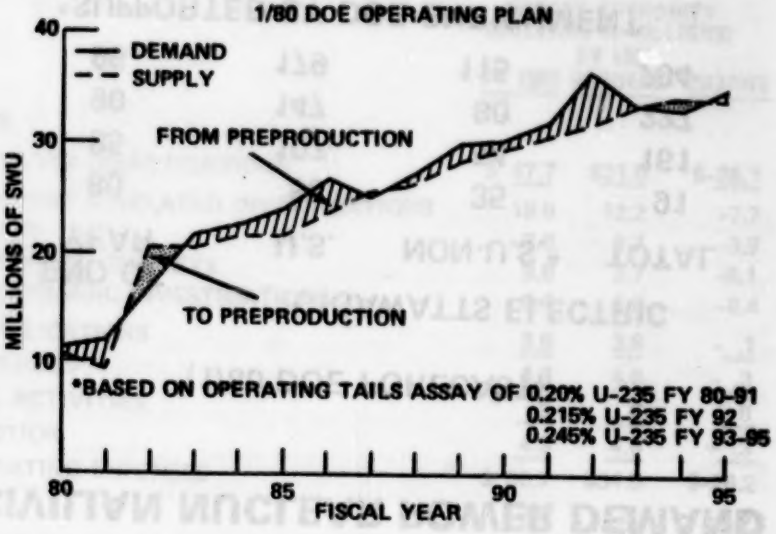


CHART 11

SEPARATIVE WORK* CONTAINED IN THE DOE LOW ENRICHED URANIUM INVENTORY

(1/80 DOE OPERATING PLAN)

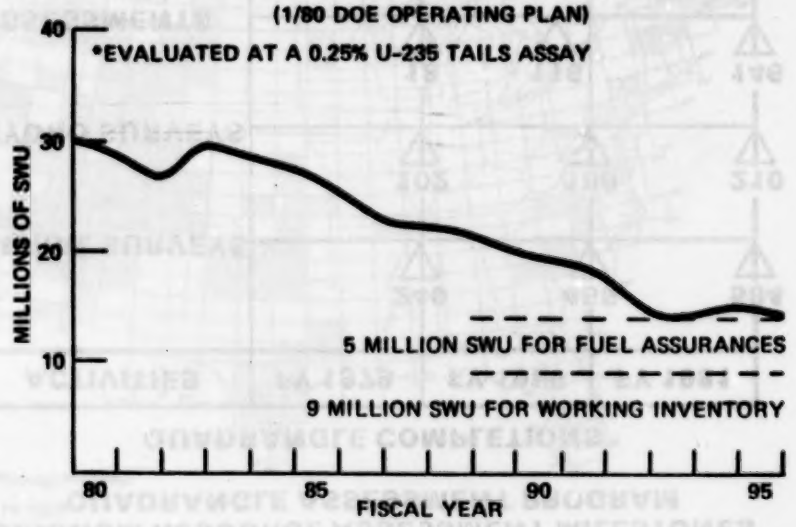
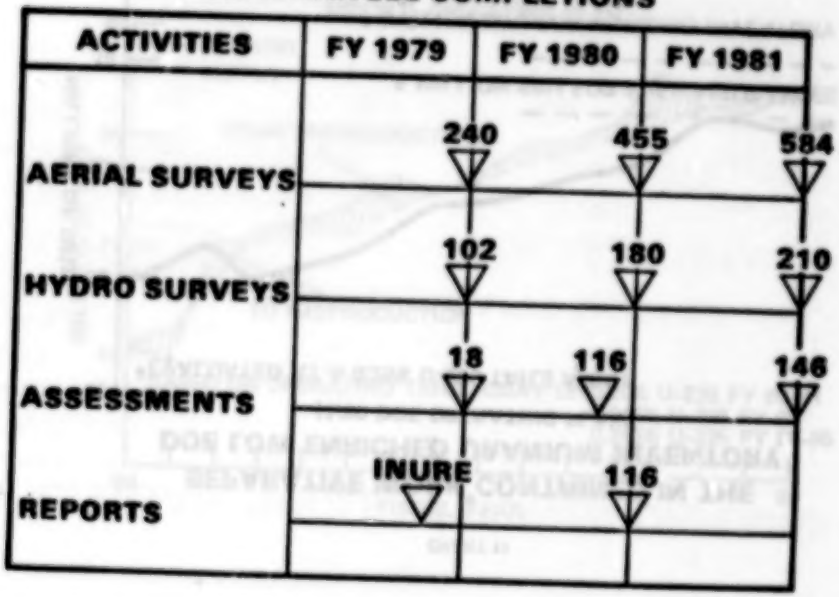


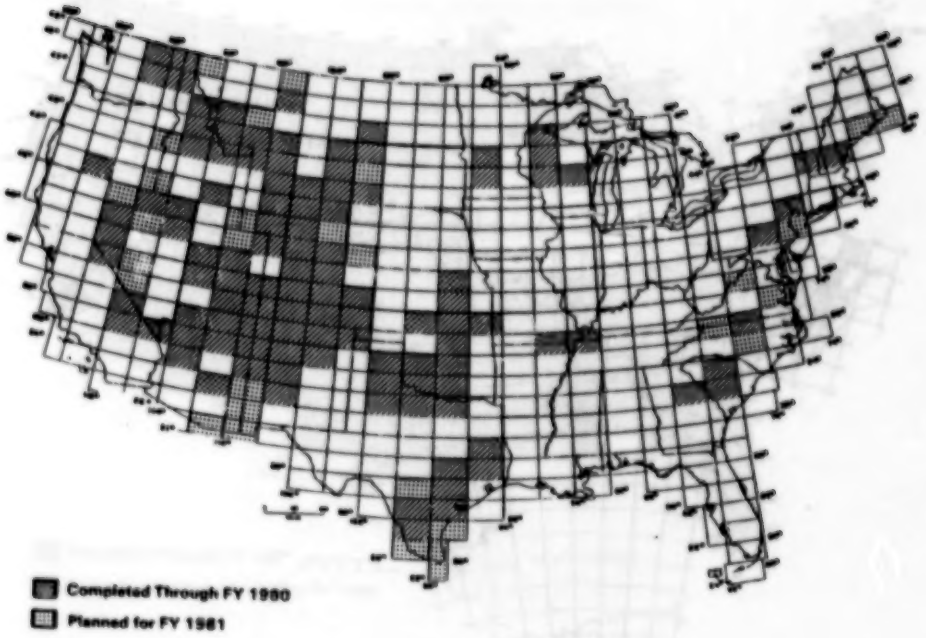
CHART 12

URANIUM RESOURCE ASSESSMENT MILESTONES
QUADRANGLE ASSESSMENT PROGRAM

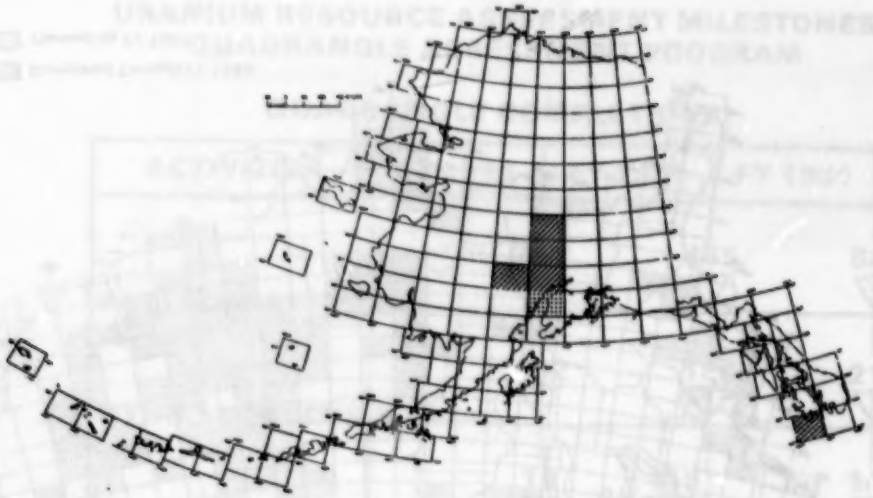
QUADRANGLE COMPLETIONS



QUADRANGLE ASSESSMENTS



QUADRANGLE ASSESSMENTS



12/31/79

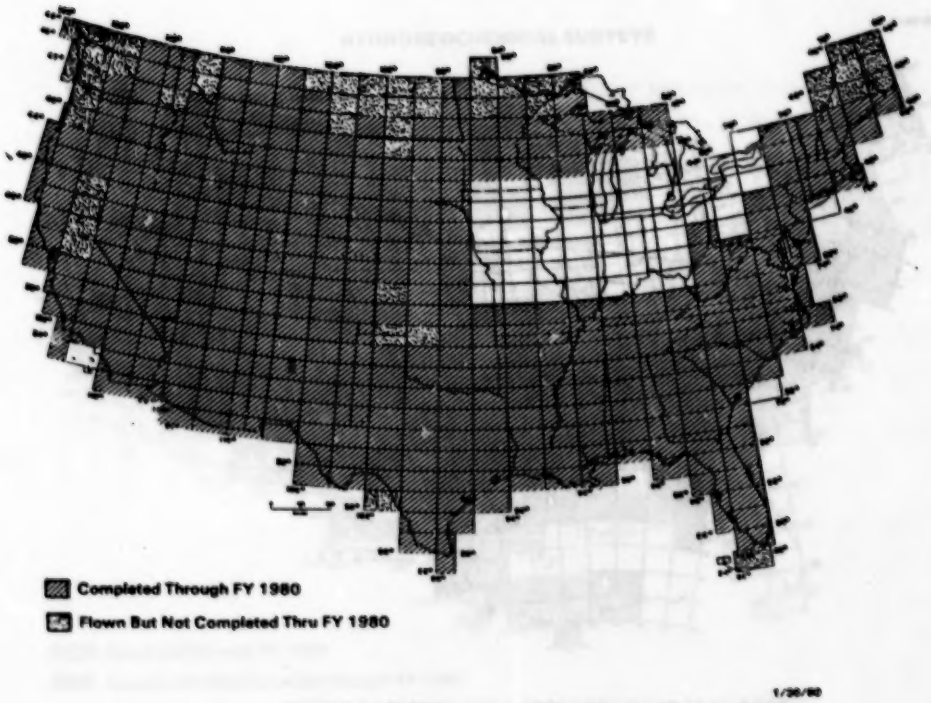
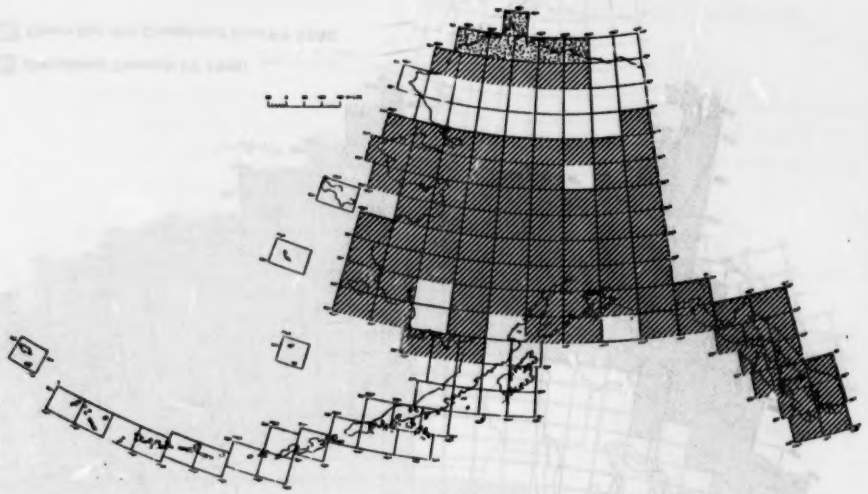

Completed Through FY 1980
Flown But Not Completed Thru FY 1980
1/30/80

CHART 16

AERIAL RADIOMETRIC RECONNAISSANCE SURVEYS

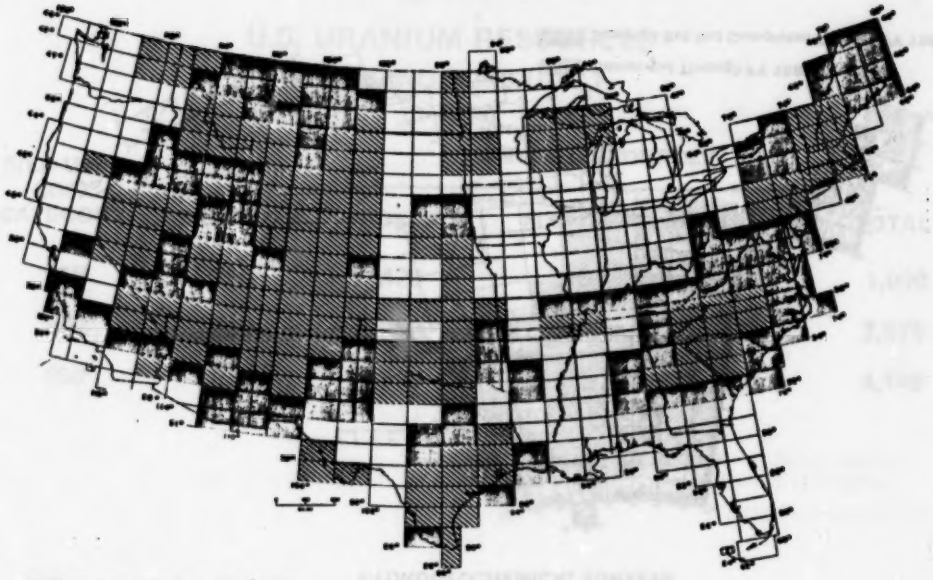


Completed Through FY 1980

Flown But Not Completed Through FY 1980

1/26/80

HYDROGEOCHEMICAL SURVEYS



Completed Through FY 1980

Sampled But Not Completed Through FY 1980

1/30/80

CHART 18

HYDROGEOCHEMICAL SURVEYS

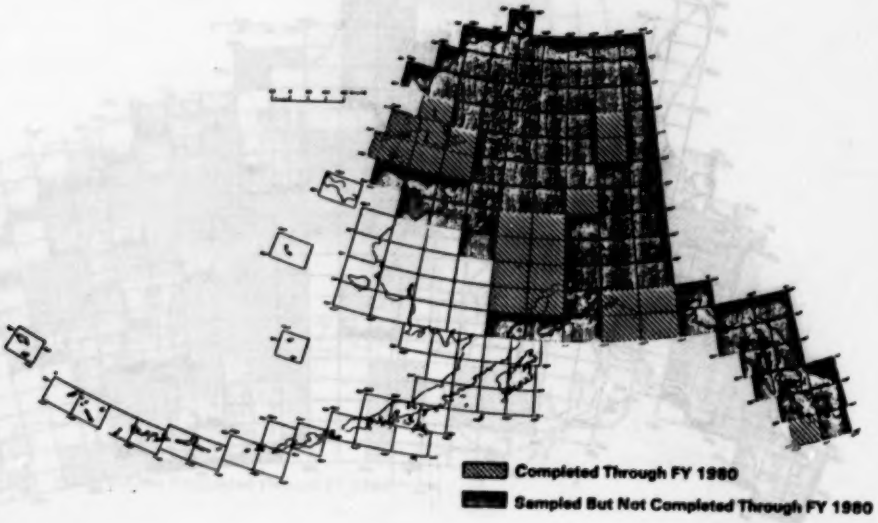


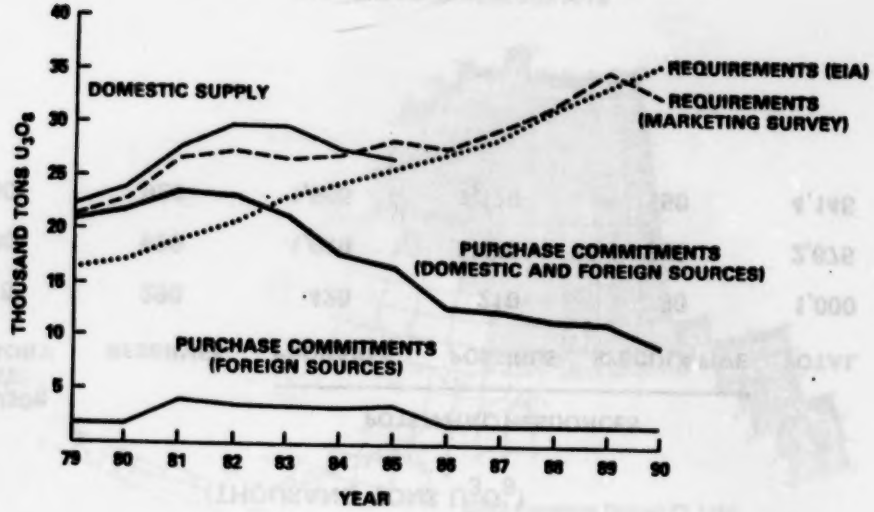
CHART 19

U.S. URANIUM RESOURCES
(THOUSAND TONS U_3O_8)

$/LB U_3O_8 COST CATEGORY	RESERVES	POTENTIAL RESOURCES			
		PROBABLE	POSSIBLE	SPECULATIVE	TOTAL
$15	290	420	210	80	1,000
$30	690	1,010	675	300	2,675
$50	920	1,505	1,170	550	4,145

CHART 20

DOMESTIC URANIUM SUPPLY vs REQUIREMENTS



4 APR 1979

Ambassador Gerard Smith
Department of State
S/AS - Room 6333
Washington, D. C. 20520

Dear Mr. Ambassador:

Pursuant to our meeting, I am pleased to be sending you the marketing package that the Office of Uranium Resources and Enrichment is deploying worldwide. It contains brief summaries of our activities and capabilities in the enrichment area. The package was principally prepared in order to counter the aggressive marketing efforts of our European competitors with U.S. and non-U.S. customers. It would be our pleasure to provide you with additional information on our enrichment activities if you so desire.

I would also like to call to your attention an area of potential problems, falling not only on this Office, but more so on the Government of the United States. The problems concern our foreign customers' perception of the U.S. capacity to effectively deliver the product to our customers. Specifically, I am making reference to a trend which may be starting whereby foreign purchasers are terminating their contracts with the Department of Energy, due primarily to customers' objections to U.S. non-proliferation criteria and uncertainties regarding the timely issuance of export licenses.

A specific case in point concerns the Badenwerk/EVS utilities in Germany and their Philippsburg 2 Reactor. In October 1971, the Euratom Supply Agency signed a Requirements contract with the Atomic Energy Commission for the supply of fuel for the Philippsburg 1 and 2 Reactors, each with a planned rating of 864 MWe. Later, as the plans became firm, the second unit's capacity was increased to 1253 MWe. The utility then requested a larger fuel supply, but the AEC's supply capacity had been fully committed by then, so the Badenwerk Utility was held to the 864 MWe. The contract was for 0.84 million SWU's of enrichment services to be delivered from 1982 through 1990 with a value of approximately $75 million in FY 1980 dollars.

On February 21, 1979, the Badenwerk Utility terminated the Philippsburg 2 portion of their contract with DOE and gave the insecurity of supply as the principal reason. The decision to terminate a DOE Requirements contract in favor of entering into a contract with another supplier (as Badenwerk is doing) is quite surprising, since the terms and conditions of our Requirements contract are very favorable to the customer and are not matched by any other supplier. It even allowed termination without penalty to the purchaser if the action were taken some 3½ years prior to delivery. The Badenwerk Utility exercised this option in accordance with the appropriate schedule.

Two weeks ago, representatives from the Badenwerk Utility, as well as representatives from Exnatom, came to Washington to explain the rationale for the Utilities Corporation decision. As the conversation ensued, the representatives from the Federal Republic of Germany stressed that they were extremely pleased with the quality of the product, the timeliness of deliveries, the terms and conditions of the contract, and the price per SWU. They further reiterated the decision to terminate was based on what they termed "security of supply," meaning their lack of confidence not in the U.S. ability to produce the enriched uranium on the desired time schedule, but in their ability to obtain a license to export the material. They pointed out that licensing approval is required from a number of branches of the U.S. Government outside DOE, including the Departments of State, Defense and Commerce, the Arms Control and Disarmament Agency, and the Nuclear Regulatory Commission, and that nuclear fuel needed by their reactors could be held up by any one party in this long chain. They pointed out that indiscretionary action such as political changes affecting export licensing is tantamount to a breach of contract. They, as a utility organization, entered into an agreement with the United States and the U.S. Government was obligated to meet its commitment. They went on to say that the terms and conditions of the non-proliferation treaty were meant to be applied between nations and not to a utility, as their purpose was to provide electric power and not nuclear bombs.

The representatives from Germany had no hesitation to point out that they were quite willing to purchase fuel elsewhere in the world market, under an assured delivery schedule and even at a price above that of the United States in a market that has a surplus of SWU's. We have learned that they have even entered into a contractual arrangement to purchase SWU's from the Soviet Union as well as from URENCO.

In summary, I believe that they are giving us a serious warning. We still have 17 enrichment contracts with Germany, representing about $1.5 billion in future sales. The total number of enrichment contracts with all foreign customers is 129, and these represent $13 billion in future revenues for the U.S. It is clearly important for us to make a serious effort to avert further contract terminations and loss of revenues.

The Office of Uranium Resources and Enrichment would appreciate your support and any suggestions you may have in working to alleviate some of the conflict and barriers which exist among the various Government Departments. We would like to continue on with our marketing activities so as to comply with the April 1977 Presidential commitment to prove to the world that the United States is a reliable source of nuclear fuel to those countries who will join us in the non-proliferation endeavors.

Sincerely,

ORIGINAL SIGNED BY
W. R. VOIGT, JR.

William R. Voigt, Jr., Director
Office of Uranium Resources
and Enrichment

Press Intelligence, Inc.
WASHINGTON, D.C. 20005
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Uranium-Supply Data Back Call for Switch To Breeder Reactors

Special to THE WALL STREET JOURNAL

PARIS—The non-Communist world's uranium-ore reserves will supply its nuclear industry for the next 15 to 20 years but eventually will be depleted if the current light-water reactors aren't replaced by fast-breeder reactors, two nuclear energy agencies warned.

A report drafted jointly by the Nuclear Energy Agency of the Organization for Economic Cooperation and Development, Paris, and the International Atomic Energy Agency, Vienna, said the uranium ore market is soft and prices are relatively low. Nevertheless, it added, exploration and production should be accelerated because demand is bound to rise.

The study could intensify the controversy over President Carter's go-slow policy toward the development of fast-breeder reactors in the U.S. That policy is based on the ground that such reactors may be dangerous because they use highly enriched nuclear fuel. American specialists participated in the drafting of the European agencies' report, which firmly endorsed breeder reactors as the only known way to avoid a major shortage of uranium fuel around the year 2025.

France advocates the construction of breeder reactors and asserts that they are safe.

But some observers cite the argument that world-wide construction of such reactors could stimulate the proliferation of nuclear weapons, as the highly enriched fuel also can be turned into nuclear explosives.

The study said the non-Communist world in 1980 will need 28,000 to 32,000 tons, well below the maximum production capacity of nearly 50,000 tons. By 1990, though, requirements will rise to 60,000 to 88,000 tons of uranium, depending on the speed of nuclear plant construction and the type of facilities built.

The report said that beyond 1990, projections of demand vary widely because of the uncertainty about the type of reactors and the rate of growth of nuclear power. The report warned that by the year 2025, "Cumulative lifetime requirements could range from four million tons of uranium to 20 million tons, depending on the reactor mixes actually in use."

"If construction continues to be dominated by water reactors," the study continued, "the rate of demand will rapidly deplete currently known resources." The report said that because uranium resources are unevenly distributed around the world, the problem of using breeder reactors may become of "vital concern" for some countries even before the end of the century.